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POLLUTION OF LAKE MICHIGAN AND ITS TRIBUTARY BASIN. PROCEEDINGS OF CONFERENCE HELD AT CHICAGO, ILLINOIS, ON JANUARY 31, FEBRUARY 1-2, FEBRUARY 5-8, 1968. EXECUTIVE SESSION, MARCH 7, 8 AND 12, 1968. VOLUME I

Federal Water Pollution Control Administration
Washington, D.C.

March 1968

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PROCEEDIN

Volume 1

N
ILLINOIS
INDIAN

Chicago, Illinois
Jan. 31, Feb. 1-2, Feb. 5-7, 196
Executive Session
March 7, 8 and 12, 1968

CONFERENCE

Pollution of Lake Michigan and its tributary basin

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U. S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

481

CONFERENCE

ON THE MATTER OF POLLUTION OF LAKE MICHIGAN AND ITS TRIBUTARY BASINS

held in
Chicago, Illinois

CONFERENCE SESSIONS:

January 31, 1968
February 1, 1968
February 2, 1968
February 5, 1968
February 6, 1968
February 7, 1968

EXECUTIVE SESSIONS:

March 7, 1968
March 8, 1968
March 12, 1968

TRANSCRIPT OF PROCEEDINGS

Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C.

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The report is on

The Conference on ~~the Matter of~~ Pollution of Lake Michigan, and its Tributary Basins, con~~vened at 11 o'clock a.m.~~, on January 31, 1968, at the Sherman House, Chicago, Illinois.

It includes statements, recommendations, and discussions on [illegible] Members in attendance, algae growth, anti-pollution programs, and related information.

PRESIDING:

Hon. Max N. Edwards, Assistant Secretary
U. S. Department of the Interior
Washington, D. C.,

and

Murray Stein
Asst. Commissioner for Enforcement
Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C.

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Northeastern Regional Planning Commission
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Ottmar A. Jahnke
Master & Pilot
Milwaukee, Wisconsin

Hon. Warren P. Knowles
Governor
State of Wisconsin

Herbert Moore, Consulting Engineer
Moore & Peterson
Milwaukee, Wisconsin

Hon. Gaylord Nelson
The United States Senate
State of Wisconsin

Gerald L. Paul, Hydrologist
Northeastern Wisconsin
Regional Planning Commission
Appleton, Wisconsin

PARTICIPANTS (CONTINUED):

WISCONSIN PRESENTATION:

H. C. Brockel, Municipal Port Director
Board of Harbor Commissioners
Milwaukee, Wisconsin

Hon. James C. Devitt
Member, Committee on Conservation
Milwaukee, Wisconsin

Martin Hanson
Secretary, Wisconsin Wildlife Confederation
Millen, Wisconsin

Mrs. Tom Helmbrecht
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Richard Hemp, Executive Director
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Mosinee, Wisconsin

Leo W. Roethe, President
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Mosinee, Wisconsin

City of South Milwaukee, Wisconsin

OTHERS IN ATTENDANCE:

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Joseph F. Adamczyk, State Director
National Association of Power Engineers
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J. H. Aeschliman
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Hon. William Christy, Senator and Chairman
Conservation Committee
Hammond, Indiana

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Evanston League of Women Voters
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Ron Anton
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James Arkin, Immediate Past Chairman
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Hank Babbitt
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Irving Berstein, Chemical Engineer
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Congressman Robert McClory, 12th District
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Kent County & Grand River Watershed
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Regional Commissioner of Customs
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OTHERS IN ATTENDANCE (CONTINUED):

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Cook County Clean Streams
River Forest, Illinois

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Conservation Education Committee
Green Bay Board of Education
Green Bay, Wisconsin

Robert S. Burd, Director
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OTHERS IN ATTENDANCE (CONTINUED):

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City of Kenosha
Kenosha, Wisconsin

Mrs. Robert M. Burnett
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Sol Burstein, Vice President
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OTHERS IN ATTENDANCE (CONTINUED):

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OTHERS IN ATTENDANCE (CONTINUED):

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Roland Eisenbeis
Superintendent of Conservation
Forest Preserve District, Cook County
River Forest, Illinois

Abe Eiserman, Trustee
Metropolitan Sanitary District
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OTHERS IN ATTENDANCE (CONTINUED):

Mrs. Giles A. Eldred
Water Pollution Chairman
Rock Island League of Women Voters
Rock Island, Illinois

Mrs. Paul Elliott, Secretary
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Marshall C. Elmore, Chairman
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Lake County Fish & Game Protective Assn.
Whiting, Indiana

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Stokely Van Camp Inc.
Hart, Michigan

J. E. Stein, Director
Research & Development
Metropolitan Sanitary District
of Greater Chicago
Chicago, Illinois

A. E. Steinbrecher, General Manager
Northern Michigan Electric Corp.
Bayne City, Michigan

Jack W. Steiner, Sanitary Engineer
Water Purification Division
Chicago, Illinois

S. M. Stephenson, Director
Department of Environmental Health
Holland, Michigan

A. M. Sterba, Associate
Consoer, Townsend & Associates
Consulting Engineers
Chicago, Illinois

OTHERS IN ATTENDANCE (CONTINUED):

Bennett M. Stewart, Asst. to Chairman
Chicago Federal Executive Board
Chicago, Illinois

Susan Stocking
1570 Ashland Avenue
Evanston, Illinois

Fred Stone, Sales Manager V
Monogram Ind.
Los Angeles, California

Jerry Stostrom
Community News Service
Chicago, Illinois

William Straczek
Director of Laboratory
Sanitary District of Bloom TWP
Chicago Heights, Illinois

Philip B. Straus
Legislative Assistant
Illinois Legislature
Highland Park, Illinois

Earl E. Strayhorn, Vice President
Metropolitan Sanitary District
of Greater Chicago
Chicago, Illinois

Len Strong, Senior Engineer
Honeywell Inc.
Harvey, Illinois

Mrs. Mad W. Sueewsky, Legislative Chairman
Wisconsin Federation of Women's Clubs
Mequon, Wisconsin

Martin Suess
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OTHERS IN ATTENDANCE (CONTINUED):

D. A. Sullivan, Consulting Engineer
314 West Suttenfield
Fort Wayne, Indiana

David Sullivan, Reporter
United Press International
Chicago, Illinois

Mrs. James N. Sullivan
Tri-City Advertiser
Dolton, Illinois

E. R. Sutherland, Chairman
Thilmany Pulp & Paper Company
Kaukauna, Wisconsin

R. J. Sutphen, Division Manager
Dunbar & Sullivan Dredging Company
Chicago, Illinois

Art Swaer
Wholesale Fish
Green Bay, Wisconsin

Kenneth A. Swarts, Senior Engineer
Nuclear, Consumers Power Company
Jackson, Michigan

Arlene Szlung, Secretary
Federal Water Pollution Control Administration
Chicago, Illinois

Bruno Szpieg, Jr.
Plant Facilities Engineer
Continental Motors Corporation
Muskegon, Michigan

Mrs. Vera Tharp, Dietary Consultant
614 South Fourth Street
Springfield, Illinois

Eugene Theios, Asst. Director
Division of Environmental Health
Lake County Health Department
Waukegan, Illinois

OTHERS IN ATTENDANCE (CONTINUED):

Richard R. Thiel
University of Wisconsin
Woddelton, Wisconsin

George E. Thiem, Trustee
Metropolitan Sanitary District
of Greater Chicago
Chicago, Illinois

Walter V. Thomas, Health Physicist
USAEC, Chicago Headquarters
Argonne, Illinois

Charles W. Thompson, City Manager
City of Wyoming
Wyoming, Michigan

Collins E. Thornton
Executive Asst. to Mayor
Michigan Grand River Watershed Council
Lansing, Michigan

Mrs. George Timmer
League of Women Voters
Elmhurst, Illinois

R. L. Toering, General Supervisor
Fuel & Steam Engineering
U. S. Steel - Gary Works
Gary, Indiana

Mrs. Ted Tom
League of Women Voters
Munster, Indiana

John W. Townsend
Consoer, Townsend & Associates
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Lee E. Townsend, Director
Rochester Program Office
Federal Water Pollution Control Administration
Rochester, New York

OTHERS IN ATTENDANCE (CONTINUED):

M. L. Trager, Administrative Assistant
Indiana & Michigan Electric Company
Fort Wayne, Indiana

V. P. Traina, Industrial Manager
Chicago Bridge & Iron
Oakbrook, Illinois

F. W. Trezise, Dean Engineering
University of Illinois - Chicago
Evanston, Illinois

Roy E. Trim, City Manager
City of Whitehall
Whitehall, Michigan

Mrs. Donald Trunys, Director
League of Women Voters of Indiana
Valparaiso, Indiana

Herman L. Tschentke, Chairman
Water Supply, Ridge Civic Council, Chicago
Chicago, Illinois

Fred E. Tucker, Manager
Pollution Control Services
National Steel
Weirton, West Virginia

Arthur W. Tuemler
Asst. to Works Chief Engineer
U. S. Steel Corporation
Chicago, Illinois

Logan E. Tuthill
Warren Cook Chemical Company
Richton Park, Illinois

Stan Twardy, Coordinator
Air & Water Conservation
Standard Oil Company
Chicago, Illinois

Dr. J. A. Vaichulis, Bacteriologist
Chicago Board of Health Laboratories
Chicago, Illinois

OTHERS IN ATTENDANCE (CONTINUED):

Dorothy Van de Mark
629 Fullerton Parkway
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Richard A. Vanderhoff, Regional Director
Ohio Basin Region
Federal Water Pollution Control Administration
Cincinnati, Ohio

Dr. Cornelius A. Van Doren
Branch Chief, Bombelt
USDA Research, University of Minnesota
St. Paul, Minnesota

Fred N. VanKirk
Consoer, Townsend & Associates
Chicago, Illinois

E. G. VanSickle, Executive Secretary
Michigan Canners & Freezers Assn.
Shelby, Michigan

Mrs. James T. Venerable
League of Women Voters
of Crystal Lake
Huntley, Illinois

A. D. Ventrella, Staff Engineer
Federal Water Pollution Control Administration
Chicago, Illinois

T. W. VerValin, Consultant
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Chicago, Illinois

Stanley G. Viktora, Sanitary Engineer
Federal Water Pollution Control Administration
Chicago, Illinois

Frank I. Vilen, Superintendent
Water Pollution Control Division
Kenosha Water Utility
Kenosha, Wisconsin

OTHERS IN ATTENDANCE (CONTINUED):

Albert G. Vinict, President
Board of Trustees
City of East Chicago
Department of Water Works
East Chicago, Indiana

Kenneth R. Voight
Federal Water Pollution Control Administration
Chicago, Illinois

D. L. Voigts, Technical Director
Packaging Corporation of America
Filer City, Michigan

Marilyn J. Voss
Medill School of Journalism
Northwestern University
Evanston, Illinois

Mr. Robert Vujovich
Water Debris Removal
Chicago, Illinois

James Wahlman, Associate Editor
Pioneer Newspapers Inc.
Highland Park, Illinois

DeYarman Wallace, Research Supervisor
Youngstown Sheet & Tube
Youngstown, Ohio

Mrs. Melba Wallack
League of Women Voters
Chicago, Illinois

Robert O. Waller, Chief Water Engineer
Bureau of Water, Dept. of Water & Sewers
Chicago, Illinois

John R. Walnout, City Councilman
City of Grand Haven
Grand Haven, Michigan

Henry P. Walsh, Executive Secretary
Great Lakes Anti-Pollution Society
Chicago, Illinois

OTHERS IN ATTENDANCE (CONTINUED):

Randall D. Walthius
Public Relations Representative
U. S. Steel
Chicago, Illinois

Fred Wampler, Regional Coordinator
Ohio-Appalachian Area
U S. Department of the Interior
Cincinnati, Ohio

Colonel E. B. Warner, Chief
Engineering Division, DCS LOG
5B, U. S. Army, 5th U.S. Army Headquarters
Fort Sheridan, Illinois

Mrs. Isabel B. Wasson
Water Resources Committee
Oak Park League of Women Voters
River Forest, Illinois

Bryan Watkins, District Engineer
Youngstown Sheet & Tube
East Chicago, Indiana

Earle W. Watts, Waste Supervisor
DuPont Company
Montague, Michigan

Russell V. Watts, Superintendent
North East Park District
Evanston, Illinois

Mildred B. Weary, Clerk-typist
Federal Water Pollution Control Administration
Chicago, Illinois

P. J. Weaver
Soap & Detergent Association
New York, New York

Haven A. Weckwerth, Engineer
University of Wisconsin
Janesville, Wisconsin

OTHERS IN ATTENDANCE (CONTINUED):

R. V. Weil, Asst. Manager
Engineering, Sinclair Refining Company
Harvey, Illinois

Edwin V. Weiss, Civil Engineer
U. S. Corps of Engineers, NCD
Oak Park, Illinois

Dennis Wesolowski, City Chemist
East Chicago Sanitary District
East Chicago, Indiana

J. S. Whitaker, Coordinator
Environmental Health
Union Carbide Corporation
New York, New York

James J. White, Jr., District Engineer
U. S. Army Corps of Engineers, Detroit
Detroit, Michigan

Walter E. White
Special Projects, Commercial Products
Atomic Energy of Canada Limited
Ottawa, Canada

Louis A. Whitesell, Deputy Attorney General
State of Indiana
Indianapolis, Indiana

Robert S. Whitworth, Asst. Chief Chemist
Federal Water Pollution Control Administration
Chicago Program Office
Chicago, Illinois

Edward T. Wiest, Mayor
City of Wyoming
Wyoming, Michigan

Benjamin F. Willey, Director
Water Purification Laboratory
City of Chicago
Chicago, Illinois

OTHERS IN ATTENDANCE (CONTINUED):

Oliver Williams, Information Officer
State of Wisconsin
Madison, Wisconsin

T. C. Williams, Consulting Engineer
City of St. Johns
Grand Rapids, Michigan

H. C. Wilson
7721 Coles Avenue
Chicago, Illinois

Ruth Wilson
League of Women Voters
Chicago, Illinois

Leo G. Windish, Past President
Illinois Division, Izaak Walton
League of America
Galva, Illinois

T. L. Williams, Regional Administrator
SEC, Federal Executive Board
Chicago, Illinois

P. Wittlinger, Senior Consultant
Corplan Associates
Chicago, Illinois

Mrs. Arnold R. Wolff, Vice President
League of Women Voters of Illinois
Glencoe, Illinois

L. L. Wolfson, Senior Research Associate
Industrial Bio-test Laboratories
Northbrook, Illinois

Nancy Wood
Save the Dunes
Valparaiso, Indiana

Nancy F. Wood, President
North Wood Counter Lab
Chicago, Illinois

OTHERS IN ATTENDANCE (CONTINUED):

Paul H. Woodruff, Vice President
Roy F. Weston, Inc.
Wilmette, Illinois

Mrs. H. W. Wyld, Alderman
City of Urbana
Champaign County League of Women Voters
Urbana, Illinois

Mrs. Victor Yngve
League of Women Voters
Chicago, Illinois

John R. Yost, Vice President
Manufacturing
Ott Chemical Company
Muskegon, Michigan

C. T. Young, Vice President
Wisconsin Electric Power
Milwaukee, Wisconsin

Lenard B. Young, Regional Engineer
Federal Power Commission
Chicago, Illinois

A. E. Zanoni, Associate Professor
Marquette University
Milwaukee, Wisconsin

Howard Zar
University of Chicago
Chicago, Illinois

Steven Zarbin
Chemist
Federal Water Pollution
Control Administration
Chicago Program Office
Chicago, Illinois

OTHERS IN ATTENDANCE (CONTINUED):

Donald P. Ziemke
City Manager
City of Muskegon Heights
Muskegon Heights, Michigan

Mrs. Robert Zilly
State Chairman
Water Resources
League of Women Voters of Michigan
Stevensville, Michigan

Mrs. Richard Zimmermann
Water Chairman
League of Women Voters
of Glen Ellyn
Glen Ellyn, Illinois

Everett F. Zurn
Water Pollution Control
Advisory Board
Fairview, Pennsylvania

Mrs. Walter M. Zwiger
League of Women Voters
Evanston, Illinois

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PROCEEDINGS

OPENING STATEMENT AND WELCOME
THE HONORABLE RICHARD D. DALEY, MAYOR
CITY OF CHICAGO, ILLINOIS

MAYOR DALEY: Ladies and gentlemen, Assistant Secretary Max N. Edwards, Governor Kerner, Senator Nelson, distinguished guests, distinguished public officials, ladies and gentlemen.

On behalf of the people of Chicago, I take great pleasure and pride in welcoming you to our city. You will find you could not have picked a more fortunate meeting place for your serious and great deliberations.

As you leave this building, I hope that you will take time to walk a few blocks east and view our lake front, Lake Michigan.

The lake serves Chicago in many ways. The site for the city was selected originally because the great waterways were a means of transportation. Raw materials could be hauled by barge to Chicago. With the development of the St. Lawrence Seaway Project, Chicago has become the greatest seaport on the Great Lakes. The lake has made possible the establishment and the prospering of a great industrial complex. It also is the picture-card seascape for the large hotels and apartment buildings which line our shores.

In the summertime, the lake is the playground for sail boats and pleasure craft of all descriptions. But more importantly, millions of people are depending upon Lake Michigan for their drinking water. Our citizens sun themselves along its shores and bathe at its beaches.

Lake Michigan has always been one of the most treasured assets and we deeply cherished it. We have generally prevented industry from building along the shore and thereby preserved its value as a source of recreation for the people of Chicago. Virtually all of Chicago's 29 miles of shoreline are devoted to public use, including some 30 beaches and 8 marinas.

I am happy to be here in one room

with distinguished officials from the four States sharing concern for this vital natural resource.

That concern is an immediate one. The danger is an immediate one. The danger to Lake Michigan is not a remote threat. We are told that the lake will be useless unless we do something and do it soon. I know we all feel the sense of urgency.

There is no need to review the danger signs We've all seen, the signs of beaches in many areas saying, "No swimming--polluted." We all remember the recent nuisance of dead alewives, the unseemly sight of weeds and algae along the shore, and the massive oil slicks of only last summer.

We know the problem of water pollution is increasing. We know this in ways which can be measured. During the past 20 years the City of Chicago has had to increase the amount of chlorine used to achieve water safety from 15 to 25 pounds per million gallons. This is an increase of 67 percent. We have had to increase the activated carbon dosage, to remove objectionable odors and tastes, from 24 to 41 pounds per million gallons and other chemicals used to remove suspended matter from 103 to 119 pounds per million gallons. These are increases of 71 and 15 percent respectively. In all, the cost of chemical treatment has increased by 92 percent during the past 20 years.

Professional experts from the Chicago Department of Water and Sewers will provide additional testimony later to support in detail the urgent need for water pollution control.

We know that it will be expensive to end pollution of the lake. We are not minimizing the expense; but we also know that it will never be cheaper to end pollution than right now. The cost will be several times the present amount if the lake is further degraded. Thus, delay in facing this problem now will be even more costly in the future. Eventually the price will have to be paid because the people of our several States will not permit Lake Michigan to become overgrown with weeds and algae and die a premature death.

This meeting therefore represents

both a challenge and an opportunity to plan constructively to keep this great body of water alive. Its future is in your hands.

There are those who feel that the cities have bypassed the State Governments in going to the Federal Government in Washington directly with their problems. There are some mayors who feel that only the Federal Government is in a position to help them. There is a feeling, too, that the State Governments are not overly concerned or aware of the problems of the urban centers. This four-state conference is an answer to their fears.

The State Governments of Illinois, Indiana, Michigan and Wisconsin are to be congratulated for acting as rapidly as they have in the present crisis. All four States have submitted water quality criteria and the Federal Government has recently approved the submissions of all four States.

We believe the State Governments must assume responsibility in taking the lead in efforts to revitalize Lake Michigan. It is up to the States to provide leadership for municipalities and other local jurisdictions to meet this problem in a bold and constructive manner. Drastic action is required because the situation is extreme and urgent. In Illinois we are proud of Governor Kerner's leadership in proposing programs to meet the challenge. A billion dollar water and air management bond issue, which we are confident will be approved by the voters, is an example. Governor Kerner's request to Secretary Udall for this meeting is another example of his concern.

The four States must join forces constructively and work in conjunction with the Federal Government to establish and implement uniform standards or surely the Federal Government will be forced to impose its own regulations and implementation schedule. We need Federal guidelines, but surely we have the talent and the resources within our boundaries to meet this problem.

But meet it we must. Lake Michigan is too precious a resource to be lost because of indecision of diffused solutions.

We have the opportunity to make a

successful start today at saving a great natural blessing we all share.

In Chicago we already have taken measures to end pollution by both commercial vessels and pleasure craft. However, neither Chicago nor any other city or State can do the job alone. Pollution cannot be stopped in one area alone. It must be stopped everywhere in the lake. The waters which touch all our shores respect no imaginary boundary line.

We need help of industry also. The people of our States are keenly interested in these problems and insist on nothing less--and they are entitled to it--than a clean and safe lake.

Lake Michigan's waters can be made usable for multiple activities and has set the example for others. Over the years Chicago has spent millions of dollars to reverse the flow of the Chicago River and prevent it from discharging its filth into the lake. Hundreds of millions of dollars were expended in the construction of the world's largest waste treatment plants.

OPENING STATEMENT - MAYOR DALEY

In your States you may not be able to reverse the flow of a river, but there are constructive acts you can take. You can adopt uniform quality standards and time schedules for implementation and enforcement covering all of Lake Michigan. You can adopt a uniform set of regulations and time schedules for controlling wastes from watercraft. You can support research directed toward restoration and maintenance of pure water in the lake. And finally, you can support special efforts to provide additional financial help for the Bureau of Fisheries to conduct research into corrective measures for the alewife problem.

We would like to thank the press, the radio, the television and private organizations for their interest in this vital problem.

Speaking as the Mayor of the city, we pledge our whole-hearted support to your endeavors. This means our financial, professional and physical resources are ready and awaiting your directions in a collective effort to wage a total war to save our lake.

I am sure you will be hearing many

worthy suggestions at this conference for constructive action. I can assure you that your deliberations will be of vital interest to the people of Chicago and, indeed, to all our four States. The people of our entire area are awaiting your decisions which will bring them a cleaner, purer Lake Michigan this summer and the next and in the future.

Again I welcome you to our city. I am confident with the men and the women and with the ability and talent that is in this room we will come out with a very constructive and positive program.

At this time I would like to introduce the very able, distinguished and capable Governor of Illinois, Governor Otto Kerner.

(Applause.)

ADDRESS OF WELCOME

THE HONORABLE OTTO KERNER, GOVERNOR

STATE OF ILLINOIS

GOVERNOR KERNER: Thank you very much, Mayor Daley.

Senator Nelson of Wisconsin, Secretary Edwards, the many distinguished members who are here.

At this time, of course, I only wish to issue a few words of welcome. I will not dwell at this time on the technical statement that I wish to make later.

But I think it time that we become acquainted with the problems that face us. My interest in this area goes back long before I was Governor, when I was County Judge of this County and had considerable responsibility in appointment of and overseeing the Sanitary Districts of Cook County other than the Metropolitan Sanitary District. I was well aware of the growth of these problems, and Illinois has moved ahead internally in the streams and the lakes and the rivers of Illinois and they have been improved over a period of time. Fishlife exists today where it did not exist a number or years ago.

I think, too, that in our experience with the growth of government and its responsibility certain of these problems cannot be solved by States or local communities alone. With air and water pollution we have recognized this and there has been a cooperative move on the parts of Governments, Federal, State and local, and this is the only way that these problems can be solved.

I am aware of our neighbors on all sides and have tried to work in very cooperative and neighborly fashion. We have to agree that with currents of lakes, with currents of air and the mobility of our people a State or a local community alone cannot solve the problem. This was the purpose of my requesting of Secretary Udall the calling of a four-state meeting of those States that bound Lake Michigan.

We of the Middle West, we of the Great Lakes Basin particularly, have been most blessed by quantity and quality of fresh water. The Great Lakes, I am told, hold 30 percent of the world's fresh water supply, one of the most valuable assets that we have in our vicinity. In my visits with governors of the States to the west, the arid States, they know the value of water and they have protected it over a period of years. We have wasted it and we have polluted it and we must admit this fact or else we shall not be able to solve the problem.

I am delighted to welcome you here to the State of Illinois to solve this problem that is multi-state in nature and affecting millions of people and not only the present but the future of this entire lake region area.

At this time I would like to introduce to you your host and your chairman of this meeting. Unfortunately, Secretary Udall is ill. We all know what a hardy man he is; I have tried to keep up with him walking, and I walk at a fairly good pace. But unfortunately, he is laid up with the flu, I understand, and cannot be here. Secretary Edwards is here to take over and will chair this meeting. Secretary. (Applause.)

STATEMENT OF THE HONORABLE
MAX N. EDWARDS, ASSISTANT SECRETARY
U. S. DEPARTMENT OF THE INTERIOR
WASHINGTON, D. C.

ASSISTANT SECRETARY EDWARDS: Thank you, Governor Kerner.

Mayor Daley, Senator Nelson, distinguished guests, members of the press, and all friends who are engaged in that worthy battle for clean water.

I would like to compliment each and every one of you not only for your attendance but particularly for your enthusiasm.I can see that you mean business, and I hope that after this conference has concluded you will agree that we mean business.

Last night was a rare historic evening in the Nation's Capitol. I was fortunate in having the opportunity to accompany Secretary Udall to Ford's Theater, where more than 103 years ago John Wilkes Booth struck down the Great Emancipator. Last night a terrible thing happened at Ford's Theater. No one was shot, but Secretary Udall was stricken with the flu, and when I went by to pick him up this morning at 7:30 he was in agony and just unable to make the trip here--one which he has planned attending for some time and one in which he has great dedication and interest. I realize that this is a disappointment to all of you. I will do my very best to represent him by reading the statement which he had prepared.

STATEMENT OF SECRETARY UDALL

STATEMENT OF THE HONORABLE STEWART L. UDALL, SECRETARY OF THE INTERIOR

PRESENTED BY

ASSISTANT SECRETARY MAX N. EDWARDS

ASSISTANT SECRETARY EDWARDS: "We are here to put positive action into our concern to save one of the Nation's great natural resources--Lake Michigan.

"Lake Michigan is sick, but I believe we are all determined it shall not die. That is why we convene this Federal enforcement conference on the water pollution problems of Lake Michigan and its tributaries.

"We are here today because of the foresight, determination and leadership of many people, especially Governor Otto Kerner of Illinois and Senator Gaylord Nelson--leading spokesmen for strong governmental policy for water quality. Both of them asked me to call this enforcement conference.

"Also, I thank our host, Mayor Richard Daley, who seeks at every opportunity a better environment for the people of Chicago and whose strong leadership has commanded constructive and positive action for cleaner waters. We will get Lake Michigan cleaned up faster if we translate his decisive call into equally decisive action.

"I congratulate the Chicago press and other news media of the area for their campaign against water pollution. This forceful, penetrating news coverage has been instrumental in arousing public awareness and personalizing the shame of pollution. It is in the finest tradition of the public interest news service.

"The parties to the conference--the States of Illinois, Indiana, Michigan and Wisconsin, and the Federal Government--have a stake in the outcome of this enforcement conference and the future of Lake Michigan.

"Lake Michigan has been rich in aquatic treasures for the five and one-half million citizens in its Basin. Other millions in the surrounding area, and, indeed, in the Nation, have reaped its benefits.

"Today, its waters satisfy the demands

of millions of people in fifty cities for one and one-half billion gallons daily. Industry pumps out another four and one-quarter billion gallons daily to produce the fabric of a prosperous society.

"Lake Michigan is a swimming place, waterskiing and boating grounds for millions. Five-hundred and thirty-six of the 625 recreation areas of the Basin are water-oriented, and there are 74 recreational harbors.

"The deep-draft navigation chain of the Great Lakes enables ships to transport annually nearly one hundred million tons of goods--coal, iron ore, stone, grain, petroleum products--over Lake Michigan to markets and manufacturers.

"The Lake and its tributaries are nursery and habitat for commercial and sport fisheries.

"But there are other facts that are not to be recited with such pleasure.

"A stench rises from its shore at Chicago, and algae slime the shore of Calumet Park beach.

STATEMENT OF SECRETARY UDALL

"'Polluted water--no swimming' signs are posted at favorite beaches in Hammond, Green Bay and Milwaukee.

"Oil scums foul Sturgeon Bay, and debris clogs the Indiana Harbor Ship Canal.

"Fish slosh belly up onto the beaches of Indiana Dunes.

"The commercial fishing industry totaled $9.3 million in 1963, a drop from the $15.6 million catches in the 1950 period.

"The City of Green Bay spent millions for a 50-mile pipeline to reach a fresh municipal water supply in the lake.

"These are symptoms of a sick lake. And they recur too often for comfort. The symptoms should be familiar. We saw them 15 years ago in Lake Erie, victimized by pollution in just this way. An enforcement conference was called in 1965 to cope with Lake Erie's critical pollution conditions. For years, that lake was the dumping grounds for unchecked municipal and industrial wastes.

"Lakes age naturally and in thousands of years they die. But Twentieth Century man--

his numbers, his activities and his machines--when unchecked, accelerate this action called eutrophication. A lake once served hundreds of generations of men. Now one generation of men can destroy a lake--permanently.

"Man's activities add more nutrients, overfertilizing the aquatic plants in a lake. These plants increase and, when they die, organic deposits pile up on the lake bottom. The lake becomes shallower, smaller, warmer, and organic decay depletes the supply of oxygen. The lake becomes a marsh and eventually disappears.

"The serious accelerated eutrophication of Lake Erie shows algal growths occurring with increased frequency. Obnoxious slimes and odors are prevalent, and areas of the lake bottom are devoid of oxygen. The value of the lake is seriously impaired.

"As a result of the Lake Erie Enforcement Conference, we now have a remedial program of pollution abatement worked out to slow down this aging. But, purity of the kind known at the turn of the century can never be restored to Lake Erie. Man acted too late.

STATEMENT OF SECRETARY UDALL

"Not so with Lake Michigan. We are luckier here. We now have more knowledge and foresight. We recognize the symptoms in an earlier stage and are in a position to arrest the disease. We still have time to restore quality to the lake.

"Lake Michigan's pollution problem today would compel action, even if conditions were static. But, conditions are not static and this compounds the problem. Without swift and effective action, we will soon face another Lake Erie situation.

"Demands on the resources of Lake Michigan multiply and intensify. In 50 or 60 years, it is predicted that:

"--the population of the Basin will double;

"--industry will expand six times;

"--industrial demands for lake water will increase three times;

"--municipal demands for lake water will increase three times;

"--water recreation demands will increase three times.

STATEMENT OF SECRETARY UDALL

"Delay means death to Lake Michigan. And death of Lake Michigan would be a national tragedy. So I call upon every participant at this Conference to make it an action Conference--action to analyze the problems of the lake, set goals, and implement effective pollution control solutions."

"Two previous enforcement actions have been held in the Lake Michigan Basin: the Menominee River Conference, involving Michigan and Wisconsin, convened in November of 1963; and the Calumet Area Conference, involving Illinois and Indiana, convened in March of 1965. The Menominee River Conferees recommended action to cope with problems of paper mill wastes and municipal sewage. The Calumet Conference directed a cleanup of municipal and industrial wastes in Illinois and Indiana. Today we can see some beneficial results of those Conferences.

"The Federal Government, the States and municipalities of the Lake Michigan Basin have taken other pollution abatement steps previously. Illinois and Indiana are proposing large bond issues to finance the construction of vitally important waste treatment works. Pollution has been a matter of concern to these agencies for several years.

"It has now become evident, however, that these partial actions are not sufficient to cure the problems of Lake Michigan. The disease is not limited to one limb or tributary--but affects the whole body and system of the lake. We must have a lake-wide prescription for a disease that affects the entire lake.

"Pollution crosses political boundaries; so must solutions.

"Oil that spills in the lake at Gary oozes onto the beaches at Milwaukee.

"Wastes that flow into intrastate rivers become interstate problems as the river feeds into the lake.

"Solutions must be lake-wide for such problems common to the Basin as algae growths and eutrophication, present and potential thermal pollution from electric power plants, disposal of dredged spoil, and oil discharges.

STATEMENT OF SECRETARY UDALL

"We must cope with the pollutants--both present and potential:

"--bacteria;

"--chemicals;

"--sediment and silt;

"--oil and sludge;

"--plant nutrients, phosphates and nitrates;

"--pesticides;

"--radioactive substances; and

"--heat.

"Which come from sources--both specific and general:

"--municipal sewage;

"--combined sewers;

"--urban drainage;

"--industrial wastes of all kinds;

"--Federal installations;

"--agricultural runoffs;

"--power plants, both fossil-fueled and nuclear, built and planned;

"--commercial and pleasure boats; and

"--dredging and disposal operations."

STATEMENT OF SECRETARY UDALL

"I have called this Conference today under authority granted me by provisions of Section 10 of the Federal Water Pollution Control Act. I am authorized to call a Conference of this type when requested to do so by the Governor of a State--in this case, Governor Kerner--and when on the basis of reports, surveys, or studies I have reason to believe that pollution of interstate waters subject to abatement under the Federal Act is occurring.

"Pollution subject to abatement under the Federal Act is pollution of navigable and interstate waters which endangers the health and welfare of any person. I have reports that such pollution is occurring.

"The Conference brings together State water pollution control agencies, the representatives of the Federal Government and other interested parties.

"The Conferees will be called upon to make statements. In addition, they may call upon participants whom they have invited to the conference to make statements. At the conclusion of such statements, the conferees will be given an opportunity to comment or ask questions.

"At the end of all statements, we will have a discussion and try to arrive at agreement on the facts of the situation. Then we will summarize the conference.

"Under Federal law, I am required at the conclusion of the conference to prepare a summary of it which will be sent to all the conferees. This summary must include, and I hope you will address yourselves to these issues:

"1. Occurrence of pollution in interstate and navigable waters subject to abatement under the Federal Act;

"2. Adequacy of measures taken toward abatement of pollution; and

"3. Nature of delays, if any, being encountered in abating the pollution.

"The States and the Federal Government are full partners in this conference, just as we must be full partners in the results of the conference.

STATEMENT OF SECRETARY UDALL

"I ask that the results of this conference be action--specific, strong and coordinated action by the States as individuals, the States as a group, and by the Federal Government.

"For my part, as a representative of the Federal Government, I will make recommendations for pollution abatement actions following the conference--directing positive, specific pollution abatement measures for industry and municipalities, including dates for completion of these measures.

"The recommendations, following public hearings, will be enforceable in the courts, and I assure you that I shall be prompt to do my part to see the recommendations carried out.

"In addition, the Department of the Interior has recommended legislation, and there was action in the Congress last year on important new authority for the Federal Government to control some of the problems of Lake Michigan. These include oil pollution and vessel pollution controls and funds to step up research on lake pollution as a whole. We shall continue to work for enactment of these measures and for funding of established programs.

"Action from the States at this conference must include setting uniform criteria for lake quality and agreeing on control measures to reach those quality levels. One of the most important areas of criteria and controls for the States to tackle is temperature requirements. Thermal pollution from plants planned but not yet constructed on the lake can be serious. Here is an opportunity for a dose of effective and crucial preventive environmental medicine. We didn't have this opportunity with other pollutants; we must not miss our chance on this one. We must halt thermal pollution with affirmative, coordinated action before it occurs.

"Action from individual States after the conference must include passage and enforcement of State laws to implement conference decisions. State financing of abatement actions and incentives for industrial abatement must match the magnitude of the pollution problem.

"I am sure such actions will result from the conference. They must result.

"Then we will know this conference has been a success. More importantly, we will have started the rescue of a mighty resource--Lake Michigan--from an ugly, useless death."

ASSISTANT SECRETARY EDWARDS: At this time I should like to introduce a member of the conservation team, a man who has been very active in using every energy that he has in controlling and abating both air and water pollution, a man who is a friend of the national parks, a man who has distinguished himself as a leader in the legislative field for conservation and certainly a dear friend of Secretary Udall's, the Honorable Gaylord Nelson, Senator from Wisconsin.

(Applause.)

STATEMENT BY THE HONORABLE GAYLORD NELSON
THE UNITED STATES SENATE
STATE OF WISCONSIN

SENATOR NELSON: Mr. Secretary, Governor Kerner, Mayor Daley, representatives of the participating States and interested citizens.

All of us are here today because we share a common concern for Lake Michigan, which is one of our Nation's most precious natural resources and which is now greatly threatened by pollution. I should like at the outset to commend Secretary Udall for convening this conference and Governor Kerner for requesting it. The Secretary's call comes at a critical time in the life of this great lake. It is now or never. Either we respond with a great cooperative effort or these waters will become a huge industrial-municipal cesspool.

I want at this time to commend the media who have shown an interest in this problem, particularly the Chicago Tribune, the Milwaukee Journal, the Green Bay Press Gazette, each of which ran a very significant series of articles concerning the problem of pollution and particularly pollution in the lakes.

I would like to say to the conferees something about the public concern about this problem. In the past three years or so I have spoken in every single State bordering all of the Great Lakes on the question of the pollution of these waters. I have spoken more than once in every State bordering on Lake Michigan on the question of the pollution of Lake Michigan. I have found unanimous support, without a single dissent thus far in all the speeches I have given and all the people I have talked to, not a single dissent from the proposition that it is our responsibility to start and start now with effective abatement proceedings to cease the pollution of this lake. I think there is a growing recognition all over this country that the environmental crisis that we are creating in respect to the degradation of the environment, the air and the water and the soil, is the most serious problem in the long run that confronts the country.

Lake Superior is the third greatest body of fresh water on the face of the globe. After Lake Baikal in Russia, which has 5,300 cubic miles of water, and after Lake Tanganyika in Africa, then comes Lake Superior with 2,700 cubic miles of water and Lake Michigan with 1,100 cubic miles of water, all of it being rapidly destroyed and the beginnings of the destruction now, the very slow beginnings of the destruction of Lake Superior, that should be the next lake on which a conference is called and I hope it will be. In any event, unless we reverse this trend, within 25 years there will not be left in America a single unpolluted lake, not one, and unless we reverse the trend we will end up destroying all fresh water-based recreation in the Nation.

The recently released report on the pollution of Lake Michigan spells out a debasement of water quality in the lake which is certainly unacceptable to any thoughtful citizen. We are not here, surely, to assess blame and wrangle about responsibility. The fact is the whole Nation is responsible for the degenerated condition of our fresh water assets. Every major river basin and watershed from coast to coast, without exception, is polluted, some tragically and seriously polluted and some with just the beginnings of pollution. But there is not a single major watershed or unpolluted river basin in America today. We all condoned it; we all participated in it; we all share the responsibility. Historically, all civilizations used their water courses as the conduit for waste disposal. Because of the remarkable capacity of water to cleanse itself, this worked very well until recent years. In the past half century we have increasingly loaded the lakes and streams beyond their natural capacity, and we have introduced new industrial wastes that are not biologically degradable.

I am sure that if we could turn the clock back 50 years and had the benefit of hindsight, or Teddy Roosevelt's foresight, all of us, municipalities, industries, and the general public, would agree to pay the cost to prevent the damage from occurring in the first place.

The problem now is to look to the future and rectify a problem that it is within our power to cure. That involves first a frank recognition of the existing situation. The report on Lake Michigan points out very vividly that one of America's greatest lakes is being pumped full of municipal sewage and industrial wastes.

The basic purpose of this conference is to direct efforts and resources of the four border States and the Federal Government toward setting up a meaningful pollution abatement plan for Lake Michigan.

To halt the pollution of Lake Michigan, we must identify each and every type of pollutant that is going into the lake and stop it at its source.

To accomplish this, the conference should, I believe, adopt the following goals:

1. Establish a coordinated timetable

and uniform standards for abating industrial and municipal pollution.

2. Make the entire shore of Lake Michigan fit for swimming once again.

3. Develop plans to restore the water quality in special situations such as, for example, Green Bay.

4. Stop pollution from vessels and ships of every form and from the shore and terminal facilities.

   (A) Adopt standards governing effluent from watercraft.

   (B) Recommend establishment of adequate shore facilities for handling and disposing of wastes and trash from ships.

5. Halt the dumping of polluted dredged materials into the lake wherever that is feasible.

6. Set up long-range research and action programs to stop the fertilization of the lake by detergents, agricultural fertilizers, and other chemicals. The conference should

give early special attention to DDT and other pesticides, but particularly DDT, which is already appearing in the lake in disturbing quantities.

The State water quality standards will serve as guidelines for our program to clean up the most obvious sources of pollution, industrial and municipal pollution. The first task of this conference will be to establish a coordinated timetable among the four States and uniform standards for abating municipal and industrial pollution of Lake Michigan.

The conference, I think, must address itself to the many other types of pollution which are plaguing Lake Michigan in addition to just industrial pollution that we mentioned before. Some of these sources or pollution are difficult to pinpoint, but the vast majority of them can and must be controlled if we are going to reverse the tide of pollution now infiltrating the lake.

It is critical that the conference cover not only Lake Michigan but also many of the grossly polluted tributary rivers that feed into it. In order, for example, to clean up Green Bay and make it fit for swimming--public beaches there have been closed since 1939--we must clean up the Fox River.

We must stop all dumping of sewage and refuse into the lake from ships and from the shore and terminal facilities which service these ships.

Right now our efforts to control vessel pollution at all levels, local, State and Federal, are hampered by outdated, inconsistent laws and hopelessly entangled enforcement procedures. The State of Wisconsin, for example, has no jurisdiction over waste disposal from vessels on the Great Lakes and certain other streams under Federal jurisdiction. Referring to this vessel pollution problem in its water quality standards program, the Wisconsin Department of Natural Resources said that, "consistent legislation affecting all the States seems clearly indicated."

I urge the conference to establish uniform, consistent regulations regarding dumping from ships and to make recommendations for enforcing these regulations. Further, the conference should establish standards governing effluent from vessels and ships.

The conference should evaluate the problem created by the dumping of polluted dredging spoils into the lake. Any sound recommendations that come from the present pilot studies concerning alternative methods for disposing of dredging spoils should be enforced, I think, by the conference.

Eutrophication, as you have heard, is a major problem on Lake Michigan. Lake Michigan today, however, is aging, not at a normal rate, but at a rate which has been greatly accelerated by man's activities.

Phosphates, which fertilize luxuriant algal growth, are a major contributor to the problem. Phosphates are entering our waters at a rate roughly equal to three and one-half pounds per person per year. As much as 50 to 60 percent of this amount is coming from detergents. The conference should, in my judgment, support legislation to remove from the market

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detergents heavy in phosphates or any other substances which have a harmful--serious harmful--effect on water quality.

There are, I feel, some additional problems to which the conference ought to address itself.

Pollution by non-degradable pesticides threatens the fish and wildlife in Lake Michigan. We will be frustrated in all our efforts, however, if we don't move promptly to halt the use, as I mentioned previously, of dangerous pesticides like DDT.

DDT is a lethal poison which resists breakdown for many years after application. It is easily transported by water and wind, and most importantly, it accumulates in the food chain. Scientists are gathering evidence which will show that DDT is causing wildlife fatalities and disrupting the reproductive systems of certain of our most prized birds, and we have not yet begun to evaluate the effects that these pesticides may ultimately have on man. Today some 10 million people depend on Lake Michigan for their water supply.

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In response to the rapid industrial and municipal growth in the Midwest, giant nuclear power plants are being built to supply essential electricity. We must evaluate carefully the development of these plants from the standpoint of both nuclear and thermal pollution. Water used for cooling these plants is taken from the lake and returned to it some 10 to 20 degrees warmer. The effects of nuclear power plants must be evaluated carefully and proper controls established and enforced.

Much of the success of efforts to halt the pollution of Lake Michigan depend on financing, as we all know. There are instances where we know how to cure our pollution problems but we lack the money to construct the necessary facilities.

Financial resources at all government levels today are seriously strained. I feel, however, that we must recognize the task of saving Lake Michigan for what it is, a top priority job which will require all available energy and resources.

All four of the States involved have

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their own anti-pollution programs and they are administering them conscientiously.

Many municipalities have worked hard to set up sound pollution abatement programs and have even gone so far as to pass bond issues to raise revenue needed to finance construction.

The Federal Government, the Congress and the Executive Branch made a commitment to the people to do its share in 1966 when the Clean Waters Restoration Act was passed by the Congress. We have not kept that commitment.

I am disappointed with the Administration request to the Congress for only 225 million dollars for fiscal 1969 for the Federal share of the costs of construction of sewage treatment works. An expenditure of 700 million dollars was authorized for fiscal 1969.

Last year the Congress appropriated only 203 million dollars of a 450 million dollar authorization. I was hopeful that the least that we could get for this year would be the 450 million dollars that was authorized for last year. A 450 million dollar appropriation could put us back on the schedule that we set up under provisions of the Clean Waters Restoration Act.

We should do all that we can to secure support for adequate Federal and State financing for pollution abatement programs. I think the next necessary step, in fact, is an amendment to the Federal law which ups the Federal contribution for municipalities. We went for many years on Federal matching funds of 30 percent. We changed the law so that it can go as high as 50 percent, but the fact of the matter is it ought to be 90 percent Federal money, 10 percent municipal and State money, and then every single municipality in the United States required to comply with the highest status of the art with adequate treatment plants.

It seems a great tragedy to me that everybody could universally applaud the Congress in 1955 when it decided to spend 50 billion dollars on an interstate highway system with 90-10 Federal monies with no complaint from anybody, and yet there isn't any support, apparently, for 90-10 monies to help the municipalities tackle a problem that is much more serious, in my judgment, than the transportation problem in this country.

(Applause.)

Lake Michigan is a very large body of water beset by immense, complex problems. No single State acting alone can stem the tide of pollution now sweeping the lake. Only through a massive coordinated effort will we be able to save this magnificent asset. This conference gives us that opportunity, and I hope and I am sure we will make the most of it.

Thank you very much.

(Applause.)

ASSISTANT SECRETARY EDWARDS: Thank you, Senator Nelson, for a most interesting and provocative statement.

At this time I should like to introduce the single person, perhaps more than any other individual, who is responsible for seeking this conference. I had the opportunity this morning to discuss some of the problems with him and I

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was deeply impressed by the knowledge that he has of the problems and the urgency and dedication that he expresses in wanting to do something about preserving Lake Michigan.

At this time the distinguished Governor of Illinois, Otto Kerner.

(Applause.)

GOVERNOR KERNER

STATEMENT BY

THE HONORABLE OTTO KERNER, GOVERNOR

STATE OF ILLINOIS

GOVERNOR KERNER: Thank you very much, Mr. Secretary. Mayor Daley, Senator Nelson, the many distinguished people here.

I do not want to confuse my opening statement of welcome with the technical report. I thought I at least ought to warm you up a bit before we get to the details of the problems that we are facing.

But this conference that has been called here today is not the first of the Great Lakes conferences on this subject. There is a continuing one that was called by the Federal Government concerning Lake Erie. But it is the first of such conferences where four States involving the entire border of one of our Great Lakes is meeting with the Federal Government to solve water pollution problems of a water resource common to and shared in by all of these States.

GOVERNOR KERNER

Attempts have been made for the four States to meet and to discuss their mutual problems, but it is not only logical but mutually beneficial that the Federal Government join with the States in solving these problems, because not only the States but the Federal Government share the responsibility for solving these problems. And when we speak of Lake Michigan, I think we must speak of all the Great Lakes as a body.

For over 50 years the City of Chicago has been defending its position of the withdrawal of waters from Lake Michigan and the discharge into another basin, and this has proved to be the proper course in which we must go. The States surrounding us must also look at this, but then, of course, there is a water level problem in which Illinois as well as the other Great Lakes States have been involved in the Great Lakes water basin. There is sufficient water, but there must be international understanding in order that these waters can be used fruitfully by all the States and provinces, if you wish, in the entire Great Lakes area. More water is lost by evaporation, if you please, than any other single cause in the Great Lakes Basin. The induction of new and additional waters into it and the reversal of flow, as was done in Lake Superior, can add these additional gallons of water that are needed and may be the only way that certain of the other States can solve this problem.

It is recognized that the basic responsibility for solving the water pollution problems in any State rests with that State. We in Illinois, Senator Nelson, have recognized that responsibility. I was able in this last general session of the legislature to get their approval for the placing on the ballot this next November a billion dollar bond issue for solving the problems of water and air pollution and recreation. We in Illinois sometimes lead the way and are penalized because we are ahead of the pack, as we have done in certain other areas, but we cannot wait for the Federal Government. If this bond issue is approved, municipalities, of course, will have the opportunity of using some of these funds in order that we can at the State level assume our direct responsibility within the boundaries of our own State.

But in the unique situation in which we find ourselves today, there are areas of responsibility in which the Federal Government must share, these being in the area of not only sources of pollution in Federal installations but in important interstate problems, in some of which the States must have the active participation and cooperation of the Federal Government. These problems are so basic to the health and the economic welfare of the State that we can no longer look upon cooperation as a mere expression of sentiment, but in this instance it is an economic necessity.

By virtue of its own record and the facts, it was logical that the Governor of Illinois request this conference, not only in its activities of pollution control in its intrastate streams but especially on Lake Michigan.

GOVERNOR KERNER

May I add at this point, one of the witnesses who will be here today, I think I saw him as I came in, is the very able Attorney General of the State of Illinois, William Clark, who has had more prosecutions on water pollution than any number of Attorney Generals that I know of in this State, and successful prosecutions. He has done a very admirable job.

But Illinois has set a pattern, and as this conference progresses you will hear additional definite plans unfold to assure that we in Illinois have and are taking definite steps to free our own waters and that of Lake Michigan of those waters that may be polluting it from within the State. I have issued orders to all of the State installations that they will clean up their own front yards first before we look to industry to do it. We must lead the way if we expect them to follow, and this is municipal government as well as State. But certainly this is a common water resource that we have.

I am not at this time pointing a

finger at any other State. That is not the purpose of this conference. But I am pointing a finger at Illinois and saying we are committed to rid Lake Michigan of pollution, Illinois is, and we have moved positively in this area.

These commitments have and will take definite shape during this conference and naturally the question arises: Are you, the other States and the Federal Government, planning to do likewise? While obviously the States have a responsibility and a role, likewise so does the Federal Government, and the other States. The City of Chicago is leading the way in setting a pattern for the control of pollutional wastes from watercraft. It has been covered by Senator Nelson, and while this program, which will be amplified by our State Water Pollution Control Agency, will protect Illinois waters from such sources of pollution, unless the Government agency takes the leading role in controlling wastes from interstate and international watercraft, Illinois contribution will be of little avail.

GOVERNOR KERNER

In connection with the approval by the Federal Government of the Illinois water criteria--by the way, I don't think it has been publicly announced, but the Secretary approved all of the four-States water control criteria programs. It was done, I believe, Monday morning, so that all of the criteria plans have been approved, in the event you didn't know about it.

But in connection with the approval by the Federal Government of Illinois water criteria and its implementation programs, which include certain deadlines, Illinois will honor these commitments and will proceed with all speed to carry out the enforcement program as submitted to and approved by the Secretary of the Interior. This includes short-range and long-range plans for the preservation and development of the water resources of Lake Michigan.

Illinois must have the support of the other States and the Federal Government of the position taken by the Governor and the legislature of this State that will prohibit the dumping of all materials into Lake Michigan other than inert materials such as sand, stone and rocks, which will not contribute to the pollution of this water resource. Illinois and the other States must support Federal legislation to regulate pollution by commercial vessels in interstate commerce and the Governors of the four States must direct their technical personnel to instruct the appropriate State agencies to develop uniform regulations, and where necessary, legislation to provide for the regulation of pollution from recreational watercraft. Such regulations must assure that no sewage shall be deposited in any manner so as to reach the water of Lake Michigan except through treatment facilities that have been approved by the appropriate State agency.

And while the alewife problem, I understand, does not necessarily involve pollution, it is one to which the States and the Federal Government must address themselves. Since this problem involves most of the Great Lakes, it is suggested that the Federal Government, and possibly through the recently created Great Lakes Basin Commission, address itself

GOVERNOR KERNER

with some positive action to the problem of the alewife.

The water resources of Lake Michigan are not a today commodity nor a Governmental commodity. Therefore, the success of this action program to free Lake Michigan from pollution must be shared by every individual organization, corporation and Governmental agency. All have a direct responsibility for preservation, abatement and control of pollution. Organizations and individuals in Illinois with responsible interest in the protection and preservation of the waters of Lake Michigan have responded to the invitation to participate in this conference.

And may I say I, too, thank the media of all the areas that are affected by Lake Michigan for making the public aware of this problem. I think they have done an outstanding job.

But certainly I assure you that we in Illinois are aware of the program, of the problem, and certainly we will do everything within our power to see that Lake Michigan

GOVERNOR KERNER

as well as the internal waters of Illinois are preserved.

(Applause.)

ASSISTANT SECRETARY EDWARDS: Thank you, Governor.

It occurs to me that this would be an appropriate time to recess until 2 o'clock this afternoon. But before we do that, I should again like to thank Mayor Daley for that fine statement and for his awareness of the problems that we have before this conference and for his dedication to solving them too.

(Whereupon, at 12:10 p.m., a recess was taken until 2:00 p.m. of the same day.)

AFTERNOON SESSION

(2:00 p.m.)

ASSISTANT SECRETARY EDWARDS: Ladies and gentlemen, be seated, please. The conference will now come to order.

I have the pleasure and privilege of introducing to you the Honorable William Milliken, Lieutenant Governor from the State of Michigan.

(Applause.)

STATEMENT BY THE HONORABLE
WILLIAM G. MILLIKEN, LIEUTENANT GOVERNOR
STATE OF MICHIGAN

LIEUTENANT GOVERNOR MILLIKEN: Assistant Secretary Edwards, Governor Kerner, conferees at this conference this afternoon, this week and next week, ladies and gentlemen.

I am privileged to represent Governor George Romney and the people of Michigan at this very important conference which begins today.

Michigan, as many of you know, has within her boundaries 41 percent of the entire area of the Great Lakes. Four of the Great Lakes touch our 3,000 miles of shoreline. We have more than 11,000 inland lakes and 36,000 miles of rivers and streams.

Lake Michigan, the third largest of the Great Lakes and the sixth largest fresh water body in the world, has an area of 22,400 square miles, of which more than 58 percent lies within Michigan.

In short, Michigan has more to gain from this valuable resource of fresh water than any other State, and by the same token, Michigan has more to lose if these waters are not protected from the destruction of pollution.

And I want to say at this time that Michigan stands ready to do its share of the job that needs to be done.

In accordance with the Water Quality Law, passed by the Congress in 1965, Michigan met its commitment in adopting, prior to July 1 of 1967, as required by law, water quality standards and plans for implementation and enforcement of these standards.

Secretary Udall this week has approved our water quality standards subject to the resolution of certain questions which hopefully can be cleared up within the next few days.

My purpose here today is to push for full adoption of Michigan standards, to indicate what already has been done in our State to combat pollution, and to stress the interdependency of Federal, State and local action.

If we are to work effectively together, States must know what share of total costs will be borne by the Federal Government; and local units must know what share of State and local costs will be borne by the States.

Let me indicate this interdependency by reviewing with you briefly the considerations of the large-scale bonding proposal made earlier this month to the Michigan legislature by Governor Romney.

Our goal by 1980 is to remove the threat to our inland lakes, our rivers and the Great Lakes by construction of 210 new treatment plants, by the construction of sewers for an additional 3 1/2 million people, and by the improvement of 126 existing sewage treatment plants.

The costs of this program are estimated by the Michigan Water Resources Commission at $1,200,000,000, of which $568,000,000 is for treatment and interceptor facilities and $641,000,000 is for lateral sewers and storm-water control. This is the program right now that we are asking the people of Michigan to begin to undertake to halt pollution in Michigan lakes and streams and in the Great Lakes.

Assuming a payment formula for the treatment and interceptor facilities phase of the program as proposed in Michigan House Bill 2646, whereby the State pays 25 percent, the local community 25 percent, and the Federal Government 50 percent, the respective costs would be:

State $142,000,000;

Local $142,000,000;

The Federal Government $284,000,000;

For a total of $568,000,000.

Experience demonstrates, however, that the Federal share of 50 percent cannot be guaranteed. For example, Congress authorized

$18,000,000 as Michigan share of Federal water pollution grants for fiscal 1968, but subsequently reduced this authorization and appropriated only $7,200,000.

With this experience in mind, we are assuming that the Congress may not appropriate the $284,000,000 authorized for Michigan by 1972, but may appropriate only $141,000,000.

Based upon this assumption, the State share of construction costs would be $285,000,000 ($142,000,000 State share plus prefunding of $143,000,000 of the Federal share of $284,000,000).

A bond issue of $285,000,000 plus Federal financing would pay 75 percent of the cost of building new disposal plants and improving existing plants to include secondary treatment and laying interceptor sewers for all of the municipalities, with the obligation of financing from their own funds the remaining 25 percent of such costs and, in addition, paying 100 percent of the costs of lateral sewers.

Our problem is further complicated by the fact that of the 191 municipalities required to construct new plants or to improve existing plants, some 165 are communities with populations under 500. For them, as well as for other cities with a low property valuation, the problem of financing their remaining share of the program is unrealistic. Additional State assistance is mandatory if the job is to be done.

The Governor has, therefore, proposed that a guarantee and loan fund of $50,000,000 be established so that this amount be added to the proposed bond issue of $285,000,000, making a total water treatment bond issue of $335,000,000. This is the bond issue which we are now submitting before the current session of the Michigan legislature.

A $335,000,000 bond issue repayable within 30 years would require average annual payments of 18.8 million dollars, and if Congress should later appropriate larger sums than we have estimated, the full amount of bonds, although authorized, would not need to be issued.

Hopefully this will be the case, but because we have no real assurance that the Federal Government will meet its full 50 percent commitment, we must, to be sure of attaining our goals in water pollution control, place a disproportionately heavy burden upon the State.

I recognize that these, admittedly, are Michigan problems and further time should not be devoted to them, except to indicate that other States undoubtedly find themselves in a similar predicament in trying to base major programs on a 50-25-25 percent basis in which the 50 percent may be subject to considerable shrinkage.

Michigan's past record in combatting water pollution, though admittedly inadequate, has, I believe, been significant.

We have made substantial progress in the past five years, progress made possible by the sincere concern and the interest of citizens, the responsibility of the legislature, and the leadership of the executive office. This progress includes:

Pollution control legislation which has been greatly strengthened;

State appropriations to the Water Resources Commission, which is the principal water quality control agency in our State, and these appropriations have been increased from $255,000 in fiscal year 1963 to $730,000 in fiscal year 1968;

The staff of our Michigan Water Resources Commission has doubled in that period of time;

A State grant fund has been created to assist local communities in construction of sewage treatment facilities;

Tax incentives have been granted to industries for pollution control;

And we have adopted intrastate water quality standards.

We have sent to this Conference highly qualified Conferees from whom you will be hearing in a good deal more detail on Monday and Tuesday of next week on the scope of Federal, State and local anti-pollution activities in Michigan.

As Lieutenant Governor of a peninsular State, which is known as the "Water Wonderland," I agree completely with Secretary Udall in his statement that "No resource in the country is more important than the saving of Lake Michigan."

WILLIAM G. MILLIKEN

I am greatly encouraged by this broad attack on Lake pollution which includes our sister States of Illinois, Indiana, and Wisconsin working in conjunction with Federal officials.

I would repeat that the relationship between Federal, State and local government in planning and in funding must be the best possible, in which each unit keeps its commitments to the other units. We cannot expect, for example, that local government will raise more than 25 percent of the cost of any project so long as 50 percent Federal and 25 percent State are promised.

I would say in conclusion that as already demonstrated by this conference called by the Secretary this massive pollution problem we face is not solely a local or a State problem; it is multi-state and it is nationwide. That is why I believe it is critically important for Michigan and the other three States which are meeting here today and for the Federal Government to use all of the forces of law, all of the knowledge that man possesses, to see that water, our most valuable national resource, is used wisely and kept as pure and as clean as it is humanly possible to do.

Thank you very much.

(Applause.)

ASSISTANT SECRETARY EDWARDS: Thank you, Governor Milliken.

At this time I should like to turn the gavel over to the gentleman on my immediate right, Mr. Murray Stein, who is the Assistant Commissioner for Enforcement of the Federal Water Pollution Control Administration. He will assist me in chairing the remainder of the conference.

MURRAY STEIN, ASSISTANT COMMISSIONER
FOR ENFORCEMENT, FEDERAL WATER
POLLUTION CONTROL ADMINISTRATION
U. S. DEPARTMENT OF THE INTERIOR

MR. STEIN: Thank you, Secretary Edwards.

I think before we continue, we might have the panel introduce themselves, and I will call on the States as I hope to call on them for their presentations in alphabetical order.

INTRODUCTION OF CONFEREES

Illinois. Will the Illinois conferees indicate who they are?

MR. KLASSEN: I am Clarence W. Klassen, Technical Secretary of the Illinois Sanitary Water Board, and have been officially designated the conferee by that Board.

On my left is Dr. Franklin D. Yoder, the Director of the State Department of Public Health in Illinois and Chairman of the Illinois Sanitary Water Board.

MR. STEIN: May we have Indiana?

MR. POOLE: I am Blucher Poole, Technical Secretary of the Indiana Stream Pollution Control Board, and I have been designated by Governor Branigin as one of the Indiana conferees.

On my immediate left is John Mitchell, who is Director of the Department of Natural Resources of the State of Indiana, and he has been designated by Governor Branigin as my co-conferee.

On his left is Colonel Charles Sidle, who is Chairman of the Indiana Stream Pollution Control Board.

INTRODUCTION OF CONFEREES

MR. STEIN: Michigan.

MR. OEMING: Mr. Chairman, I am Loring F. Oeming, Executive Secretary of the Michigan Water Resources Commission.

On my left is Mr. George F. Liddle, the Chairman of the Michigan Water Resources Commission and former City Manager of Muskegon, Michigan, on Lake Michigan.

MR. STEIN: May we have Wisconsin.

MR. HOLMER: Mr. Stein, the letter of invitation to attend this conference addressed to the State of Wisconsin designated the Department of Resources Development as the conferee for Wisconsin. This did not take into account the fact that Wisconsin has undergone a reorganization in which the Department of Resources Development has become the Division of Resource Development in a Department of Natural Resources.

The Chairman of the Natural Resources Board is Mr. Russell G. Lynch, who has been designated as Governor Knowles' personal representative at this conference.

The Secretary of the Department of Natural Resources, the second man to my left, Lester P. Voigt, is also a representative at this conference of the State of Wisconsin.

I am Freeman Holmer, Administrator of the Division of Resource Development in that Department.

MR. STEIN: Glad to welcome you, particularly Mr. Lynch, who is the personal representative of the Governor. Most of the people on the panel are old pros in the business and we know them well. Russ Lynch has been an old pro too, but this is the first time I have seen him in an official capacity. Generally he has been, as many of you well know, one of the star reporters of the Milwaukee Journal, and in the '20s and '30s he was the sports editor, then he became the conservation editor, and probably was the most distinguished conservation editor in the United States.

Glad to have you, Mr. Lynch. I know your remarks here probably are going to be as perceptive as they were when you were on the newspaper. I hope here not as acid.

(Laughter.)

The Federal Government -- Mr. Poston.

INTRODUCTION OF CONFEREES

MR. POSTON: I am H. W. Poston, Regional Director of the Federal Water Pollution Control Administration, Department of Interior for the Great Lakes Region.

MR. STEIN: Thank you.

We will continue with the presentations, first of the statements of the Congressional and gubernatorial staffs. In addition to that, we will have a Federal presentation and presentations from the States in alphabetical order.

All those who want to be heard should get in touch with their State agencies. We will allow each State to manage its own time. It will facilitate progress of the conference and help you if you can register with your State as soon as possible at the next recess if you want to be heard, because the management of a conference of this type sometimes gets a little complicated. We can give you a better prognosis as to a time schedule and how long it is going to last if you will all get to your States and let them know that you want to appear and if you can give them a copy of your statement with the judgment of how long you are going to take for your

TELEGRAM FROM SENATOR PERCY

presentation.

Anyone other than the conferees should come to the lectern and identify himself. It will be most helpful, if you have copies of your statements if you give them to the conferees and most importantly to Mrs. Rankin, who is making a record of the conference. We have a lot of business to do, and I think the critical point is going to be how long Mrs. Rankin can stay with us taking down these notes. She can stay with us much longer if you will give her copies of your statements when you come up.

I would like to read a telegram addressed to Secretary Stewart L. Udall.

"January 31, 1968

"I want to express my wholehearted support for and encouragement of the Lake Michigan Pollution Control Enforcement Conference. I regret that the business of the Senate prevents my being with you. However, I know I join many millions of citizens from the four-state area in appreciation of your personal attention to the pollution problems of Lake Michigan, and for your awareness that no resource problem in the country is more important than the saving of our lake. This Conference can perform a great service in magnifying and accelerating efforts by all levels of government, private industry and the public at large to arrest the strangulation of the lake It will take redoubling of the present efforts of all concerned if the present deterioration of the lake is to be arrested much less reversed. My best wishes for a revealing and constructive Conference. Charles H. Percy, United States Senator."

At this point we have the statement of Senator Philip Hart of Michigan, and we would like to call on a member of our Chicago staff, Mr. Grover Cook, to read that statement.

Mr. Cook, will you read the statement.

STATEMENT OF THE HONORABLE PHILIP A. HART
THE UNITED STATES SENATE
STATE OF MICHIGAN

MR. COOK: This is a statement of Senator Philip A. Hart to the Lake Michigan Enforcement Conference, Chicago, Illinois, January 31, 1968.

"Mr. Secretary, I regret very much that an obligation to be on the Senate floor today prevents my being with you in person to testify to my intense interest in the control of pollution on our inland lakes and rivers as on our coastal waters.

"You know that as far back as 1959 the Senate set up a Select Committee on National Water Resources. We submitted our report in January of 1961 calling attention to the danger signals with regard to the western Great Lakes. I was one of four Senators who filed Supplemental Views to that report, not disagreeing with its findings but urging a greater and more immediate effort to cope with the problem.

"That sense of urgency, expressed in 1961, is just as right today:

"'The free water frontier has passed. Additional water can no longer be taken heedlessly or effortlessly. The United States is squeezed between the pincers of inadequate water development and rapidly increasing water requirements, while pollution makes more and more of our available water unfit for human or industrial uses.

"'Our task is to manage the basic supply of water so that it will be usable at the places and times it is needed, in a quality acceptable for the desired uses. Technical studies and expert judgment indicate that this country has the competence to deal with physical problems of water supply and pollution. But we have not yet put this competence fully to work. The question is not whether we can do it--it is whether we will do it.'"

"In addition to the technical and engineering research which we must vigorously pursue, and in addition to the Federal-State-local coordination which the problem clearly demands, there are two or three specific things I believe we should do to help get on with this life-and-death job.

"1. First of all is the question of money. More adequate sums of money must be provided for the Federal contribution to construction of sewage treatment plants. Senator Muskie, Senator Williams of New Jersey and I, among others, wanted to battle this out on the Senate floor this fall, but we were assured that a request for supplemental funds could be made if the demand warranted. Well, I would like the news to travel far and wide that Michigan's eligible applications for 1967-68 totaled $202 million, of which the Federal share at 30 percent would be $60 million. What we are getting is $7,344,500. This is truly a gap. I know that the Michigan Water Resources Commission has been working manfully to fulfill its obligations and deserves all the help any of us can give it.

"2. The Midwest Federal Water Pollution Laboratory, which we were successful in locating in Ann Arbor and for which I finally secured Federal funding back in 1964, is still on the drawing boards in the Department of Interior. This is a disgraceful situation, Mr. Chairman, and the fact that it sat for three years in the Department of Health, Education and Welfare before it began sitting in Interior does not lessen the indignation.

"The holding of this conference here today is proof that there is work to be done, serious, complicated, costly work, to solve the problems of Great Lakes pollution. Our problems are not only test tube problems, they are social and economic problems, administrative problems, enforcement problems. What is needed is a comprehensive mobilization of our forces on a basin basis, and clearly the creation of the Ann Arbor Laboratory, adjacent to the great natural and human resources of the area, would be an enormous step forward in helping us put our best brains to solving these problems.

"Mr. Secretary, I appreciate this opportunity to express some of my views on this pollution problem. I know all of us in Michigan will cooperate to the fullest in its solution.

"Thank you very much."

STATEMENT OF SENATOR HART

MR. STEIN: Thank you, Mr. Cook.

As Senator Nelson, Senator Hart has followed the water pollution control problems in the Congress very closely and is very interested in these cases and in the improvement of our water resources.

Next we will call for statements which have been submitted by Representatives Sidney Yates and Daniel Ronan of Illinois, and Dr. Jacob Bregman, also a native son of Illinois, will read those statements.

I understand Congressman Rostenkowski may have a statement and may have it here before the conference is over. If he does, that will be most welcome.

Dr. Bregman.

STATEMENT OF CONGRESSMAN YATES

STATEMENT OF THE HONORABLE SIDNEY R. YATES
U. S. HOUSE OF REPRESENTATIVES, 9TH DISTRICT
STATE OF ILLINOIS

DR. BREGMAN: The following is the statement by Representative Yates:

"I congratulate Governor Kerner for his initiative in calling this Federal-State conference for the purpose of accelerating our efforts to clean up Lake Michigan. Saving the lake from the curses of further pollution must be viewed as one of the principal objectives of the Federal Government as well as the Governments of Illinois, Indiana, Michigan and Wisconsin. The people of these States are determined that Lake Michigan shall not deteriorate, decay and develop dead spots as did Lake Erie.

"It is imperative that we immediately employ our best efforts and technology to reverse the rising tide of pollution. All the citizens of the bordering States, not just the riparian communities, suffer the effects of pollution in the form of restricted recreation, the demise of commercial and private fisheries, and the destruction of aesthetic enjoyment. Although efforts to reduce the amount of pollutants dumped into the lake have increased, as yet they are inadequate. Evidence gathered since 1965 indicates a further decline rather than an improvement in the quality of the water. To preserve the lake for posterity, decisive action must be taken today.

"I specifically recommend that Congress prohibit the Corps of Engineers from dumping polluted dredging spoil into the lake and strengthen existing legislation to penalize those who release oil, sewage and other pollutants from watercraft. I urge all municipalities, especially those north of Chicago, to review the pernicious practice of dumping sewage either into the lake or its tributaries, looking to a discontinuation of the practice. Finally, I encourage the Federal Water Pollution Control Administration to adhere to its deadlines for the abatement of industrial pollution."

And now the statement by Representative Daniel J. Ronan.

STATEMENT OF THE HONORABLE DANIEL J. RONAN
U. S. HOUSE OF REPRESENTATIVES
STATE OF ILLINOIS

"Mr. Chairman, we must prevent Lake Michigan from becoming another Lake Erie. This conference, if it does its job properly, will prevent Lake Michigan from becoming another Lake Erie and will prevent continued destruction of this most valuable resource in the midwest. As I see it, if Lake Michigan goes, so goes the economy of this entire area.

"We have had enough of pollution--by alewives, by municipal and industrial wastes, and all the other wastes which are destroying this marvelous resource on which we all depend, some directly and some indirectly, for our livelihood and for our pleasure.

"The American people, the people of the Great Lakes Basin of Illinois, of Chicago, and of the Sixth District have had enough of pollution. They have had enough of spilled oil, sewage and dead alewives littering their bathing beaches and fouling their water intakes.

"I congratulate Governor Kerner, Senator Nelson, and Secretary Udall, plus the State and local officials, the members of private organizations and the press who are taking particular interest in this conference.

"I believe that we can prevent Lake Michigan from becoming another Lake Erie. The job will not be easy or short or cheap.

"As I see it, it will take sustained, persistent and dedicated efforts of Federal, State and local officials, as well as by the press and members of private organizations, if we are to prevent Lake Michigan from becoming another Lake Erie.

"And we do not have much time, because the problem has grown so great and the factors contributing to the problem are accelerating so rapidly that if we do not move fast and massively enough, we may barely keep pace with the problem or even fall behind.

"You have my support and I am sure the support of the American people to do what needs to be done to prevent Lake Michigan from becoming another Lake Erie."

(Applause.)

MR. STEIN: Thank you, Dr. Bregman. I wonder if you would convey our thanks to Representatives Yates and Ronan for those fine statements.

We will now have the statement of Governor Roger Branigin of Indiana, delivered by John Mitchell.

Mr. Mitchell.

STATEMENT OF GOVERNOR BRANIGIN

STATEMENT OF THE HONORABLE ROGER D. BRANIGIN
GOVERNOR, STATE OF INDIANA
PRESENTED BY
JOHN E. MITCHELL
INDIANA STREAM POLLUTION CONTROL BOARD
DEPARTMENT OF NATURAL RESOURCES

MR. MITCHELL: Assistant Secretary Edwards and Chairman Stein, distinguished conferees and ladies and gentlemen.

I present this statement on behalf of Governor Roger D. Branigin of the State of Indiana.

"The State of Indiana has only 45 miles of shoreline on Lake Michigan. Despite our limited access on this great natural resource, it constitutes a priceless asset to our State, serving major sectors of our economy and well-being in such diverse areas as municipal and industrial water supply, navigation, recreation and fisheries. Let me say then at the outset that Indiana intends to so protect this resource that its citizens may enjoy the benefits of all

STATEMENT OF GOVERNOR BRANIGIN

legitimate water uses within the limitations which nature and political boundaries impose upon us.

"I might add that this is neither a new policy nor is it one which applies only to the Lake Michigan sector of our State. The State of Indiana has long recognized the benefits of clean water as demonstrated by our formal Statewide pollution abatement program, exercised through the Indiana Stream Pollution Control Board, which is now in its 25th year. Throughout that long period, and unheralded by the spotlight of publicity, a solid record of progress has been achieved.

"This program was greatly strengthened by our 1967 General Assembly when a new clean water program was approved. Funds were appropriated to provide State grants of 25 percent of the cost of municipal sewage treatment facilities, and laws were enacted which exempt industrial facilities for water pollution control from personal property taxation and require the certification of the operators of sewage and industrial waste treatment plants. I believe

STATEMENT OF GOVERNOR BRANIGIN

that Indiana is the first State in the Union to require certification of industrial waste treatment plant operators.

"Further, Indiana has adopted water quality criteria and a specific program for their implementation, not only for Lake Michigan and all of the waters flowing into it, but for all waters in Indiana, both interstate and intrastate. The Lake Michigan criteria are identical to those adopted by the conferees in the enforcement case covering a small portion of the south end of the lake which was begun in 1965. The criteria for the entire State and the plans of implementation were approved by the Secretary of the Interior in July 1967. We were honored by being one of the first States--if not, in fact, the first State--to have its criteria and plans approved. Secretary Udall termed this 'a superb job'

"I assume the other States bordering upon Lake Michigan have adopted similar programs. Through our several State programs the problems amenable to control at the individual State levels will be solved.

STATEMENT OF GOVERNOR BRANIGIN

"On this basis it seems to me that the remaining area of concern, and the area to which the main thrust of this conference should be directed, is the development of a uniform approach to the control of existing and future pollution of Lake Michigan.

"There are a number of problems which can be solved only by such concerted action. These include the control of algae, oil, pollution from boats, alewives, and the disposal of dredged materials. The Indiana boating law prohibits the discharge of human waste from boats on all Indiana waters except Lake Michigan. I will ask the 1969 General Assembly to correct this deficiency. It does seem to me, however, that the control of commercial vessels can be more appropriately handled at the Federal level.

"I also favor enactment of Federal legislation strengthening the current powers of the Department of Interior on the control of oil and strong Federal leadership on the alewife problem. On dredged materials I support the position that organic material and inorganic material of a harmful nature should not be disposed of in the lake. We must recognize it takes time to work out acceptable methods and all parties concerned should work with the Corps of Engineers to develop these methods with the least practicable delay.

"In addition to these current problems, it is my view that many potential future problems of pollution can be avoided or minimized through a program of coordinated and comprehensive planning for the development of the water resources of the Great Lakes Basin. The newly-created Great Lakes Basin Commission, of which all the Great Lakes States and involved Departments of the Federal Government are members, appears to be the proper vehicle for such coordination.

"In closing, I pledge the cooperation of the State of Indiana in carrying out any sound program for the control of present and future pollution of Lake Michigan in order that future generations can enjoy to the fullest its priceless assets."

(Applause.)

MR. STEIN: We will now hear the

statement of Governor Warren Knowles, presented by Mr. Russell Lynch.

Mr. Lynch.

STATEMENT BY R. G. LYNCH

CHAIRMAN, NATURAL RESOURCES BOARD

STATE OF WISCONSIN

MR. LYNCH: Mr. Secretary, who is gone, and Mr. Enforcement Chief, who is here, conferees and others in this outstanding gathering.

I do not deliver a statement written by the Governor of Wisconsin. I represent him. The statement is mine and he is in accord with it, I am quite sure. My remarks will be short because I would like to see this conference get down to the business for which it was called.

We from Wisconsin are deeply concerned about pollution and we have come to this conference in a spirit of complete cooperation and look to it for constructive action to protect and restore Lake Michigan. Our Governor, Warren Knowles, held conferences not long ago on pollution problems of the Milwaukee and Green Bay areas in which the Federal people participated. His concern is very real about this matter.

As for myself, having spent years publicizing pollution problems through the Milwaukee Journal, I am personally very pleased at the broad scope of this conference. I compliment Secretary Udall and personnel of the Water Pollution Control Administration for making it much more than an enforcement conference.

Mr. Udall's recent approval of the four States water quality standards and plans for attaining them has helped to create a good atmosphere for this meeting. Wisconsin standards are strong and forward-looking. I helped draft them last year as a member of our State Resource Development Board. Our new Natural Resources Board is taking over the task of that Board as well as the work of other agencies.

After three decades of substantial efforts to cope with water pollution, Wisconsin intensified its attack two years ago when the legislature provided more money and manpower and stronger laws and ordered a merger of resource agencies, which will be completed by July 1 of this year.

Our Department also administers new laws to control air pollution and solid waste disposal, as well as older laws to control nearly every activity of man which affects lakes and streams.

Thus we are equipped to cooperate vigorously in carrying out proposals of this conference.

As a long-time reporter in this field, I know something of the scope and urgency of Lake Michigan problems. I would say here, as in all areas of pollution, we are 20 years late in getting at what we should do. We should have begun immediately after World War II, which not only fostered a technological explosion but had delayed the construction of sewers and sewage treatment plants. Now we need to get at it with speed because we have been falling behind all this time.

This conference must not merely discuss and recommend. As a reporter and as a participant I have been to quite a few conferences out of which very little came. I would like to see something definite come out of this one, and I think it will. We can't merely discuss and recommend here. This conference should produce programs and estimates of their cost, of the total cost.

Senator Nelson, a progressive in his fight against pollution, is a conservative when he puts a $650,000,000 price tag on this Basin cleanup. The cost of eliminating stormwater from sanitary sewers in the Milwaukee area alone may run to $300,000,000, and a real cleanup of the Fox River and Green Bay also could be enormously expensive.

Looking over the Federal recommendations which have been printed for this conference, and I agree with them fully, and contemplating the construction and the continuing research and development involved, I think that overall we are talking about a billion dollar program and in time it could run perhaps a great deal more.

Whatever the cost, the lake must be saved. This conference not only must be realistic about financing, it should admonish Congress to be realistic. We need better judgment in our national Capitol as to what is essential and what is not.

So long as sky rockets to the moon and supersonic airplanes for two percent of our people are put ahead of saving the environment for all of our people, I see little hope for the kind of Lake Michigan program we need or for any other effective environmental protection efforts. The States, local governments and industry cannot do the job. Massive Federal aid is required.

You have heard other speakers talk about the difference between what has been authorized by the Congress and what has been appropriated. The Congress when it requires States to put up money for aid to communities as a condition for getting Federal aid for those communities is guilty, in my opinion, of something for which private citizens get arrested and put in jail, and that is called a pigeon drop. I hope you are familiar with it.

(Laughter.)

I wish this conference success, and on behalf of Governor Knowles and of our Board I pledge Wisconsin's full cooperation in carrying out the programs that I hope will result from it.

Thank you.

(Applause.)

MR. STEIN: Thank you, Mr. Lynch.

Now we will go to Illinois, and I believe we will have the Health Office, Dr. Yoder.

"A PUBLIC HEALTH PHYSICIAN LOOKS AT LAKE MICHIGAN"

FRANKLIN D. YODER, M.D.
DIRECTOR, ILLINOIS DEPARTMENT OF HEALTH

DR. YODER: Mr. Chairman, Mr. Secretary, Mr. Poston, conferees of the four-state conference, ladies and gentlemen.

The title of my presentation is "A Public Health Physician Looks at Lake Michigan."

Physicians often tend to think of a patient in terms of the parts or systems which comprise the bodily processes. Today I want to discuss another concept of body health, not that of a human body, but the health of the relatively young body of fresh water we call Lake Michigan.

This body has many health similarities to its human counterpart. Both are living things, composed of organic and inorganic chemicals plus a variety of living cells and attendant organisms, some beneficial and some pathogenic or capable of producing disease.

FRANKLIN D. YODER

In the human body, the interdependence of bodily processes and organisms is called physiology. In water, this relationship between organisms and their surroundings is called ecology, a word from the Greek meaning house, plus the "ology," which means treatise or study of. Thus ecology, as we have come to know it, has many facets, all pertinent to this discussion of today's patient, Lake Michigan.

The comparison between the human body and a body of water can be carried a step farther. They both experience the aging process and both are constantly attempting to regenerate their deteriorating bodily functions to maintain a good state of health.

Throughout these discussions our primary purpose should be to halt and reverse an aging process that has not only been in progress for centuries but has now reached a point which threatens the very life of the body in which it exists.

Geologically, the Great Lakes are relatively newcomers when measured against the total panorama of earth's evolution. We are told that these great bodies of water were formed between 7,000 and 32,000 years ago. Lake Erie reached its present form about 10,000 years ago. Lake Michigan--and I don't believe anybody has yet emphasized that it is the only one of the Great Lakes lying entirely with the boundaries of the United States--reached its present development only two or three thousand years ago.

Contrary to a popular belief, man has occupied the Lake Michigan Basin for most of the lake's life. For centuries, man and possibly nature have increasingly abused this body of water.

Thus, while Lake Michigan is still young in a geological sense, healthwise it is old beyond its years. When the human body is abused or misused, aging is accelerated. This same response occurs in a body of water and the processes of eutrophication result.

Science has and is constantly studying and applying new techniques to prevent, protect and lengthen human life by slowing the effects of aging. It is not hard to imagine the loud and justifiable criticisms which would be heard if it became known the medical profession had a technique for accomplishing this but was withholding it.

Yet while recognizing there is a need for new and improved techniques and methods, for example, in the removal of nutrients and substances contributing to the aging, we presently have techniques and methods to control many of the processes involved but we are not utilizing them to protect the life of our lake.

Health is a principal component in the progress of any society. Translating its significance to our "patient," we must recognize Lake Michigan is vital to the proper social functioning of every facet of our life, personal, community and industrial.

We can classify all except one of the natural resources that are available and can be utilized to build the economy of this Lake Michigan Basin in a number of different ways. That one all-important exception is water.

As a resource, water is a requirement

that is so basic to our existence and economy that the use of all other resources are predicated upon a plentiful supply of satisfactory water. In its absence, other resources become almost valueless.

The present is often said to reflect the past, and the reflected image of Lake Michigan is not one of which we can be proud. The future will reflect the present or, more importantly, what is done as a result of this enforcement conference.

If we consider ourselves community physicians with Lake Michigan as our "patient," the prognosis is clear.

We can prolong the useful life of this comparatively young body of water or hasten its death by further procrastination or listening to economic reasons why the vital functions of the patient should be allowed to stop.

Health and money are not interchangeable commodities in the human body. The same axiom applies to the health of a body of water vital to our existence.

There are two requisites for doing a great and important work. You must have a definite plan and a specific time for accomplishing it. The time for Lake Michigan is already limited. Superficial solutions will not suffice.

On the positive side, we have certain know-hows. Patterns for administration can be resolved. We can likewise, even amidst competition for the use of Lake Michigan, pursue a sound economical and practical approach to assuring that such a resource remains suitable for our multi-purpose uses.

With characteristic human near-sightedness, we often look at Lake Michigan as a "today commodity," whereas we must take a farsighted look through the upper part of our aquatic bifocals to consider what measures will preserve this important asset.

There is no cheap or painless way to control or manage the quality of the waters of Lake Michigan. Many of its water quality problems are already old. It is our awareness of them that is new, an awakening awareness of the need to assure water quality satisfactory for domestic and industrial demand.

Therefore, let us resolve, as part of the society which lives around Lake Michigan, to take constructive action to save the life of this "patient," not only for our own sakes, but for the sake of our entire Nation.

Thank you.

(Applause.)

MR. STEIN: During this conference, and we have said this before, but this is one of the rare privileges of a conference, we have a meeting of the President's Water Pollution Control Advisory Board who are in attendance at the conference, and I believe I saw some of the members here. Are they still here, the Board members?

They may be scattered around. We welcome the Advisory Board to these conferences.

We now have a statement of Attorney General Frank Kelley of Michigan, which will be given to us by Assistant Attorney General Nicholas V. Olds.

STATEMENT OF FRANK J. KELLEY

While you are coming up here, Russ Lynch said we should do something. You know, I read the other day about some oldsters putting Goose Goslin and Kiki Cuyler in the Baseball Hall of Fame. That kind of startled me, that "oldsters," because those were the fellows who were playing baseball when I was a youngster and you were writing about them. So I guess if we don't get this lake cleaned up and have an action program, maybe we will have someone doing it for us.

Mr. Olds has worked in water resources and in the general field of the legal aspects of water resources as long as any of us and is one of the distinguished legal experts in this field.

Mr. Olds.

STATEMENT OF THE HONORABLE FRANK J. KELLEY
ATTORNEY GENERAL, STATE OF MICHIGAN
PRESENTED BY
THE HONORABLE NICHOLAS V. OLDS, ASST. ATTORNEY GENERAL

MR. OLDS: Thank you, Mr. Stein.

The paper presented here, which I shall present on behalf of Attorney General

STATEMENT OF FRANK J. KELLEY

Kelley, of course is addressed to Secretary Udall, because we were hoping that he would be here. Mr. Kelley regrets he can't be here today because he is in Washington presiding over the meeting of the National Association of Attorney Generals as its president.

"As Attorney General of the State of Michigan, I am directed by law to enforce the water pollution control statutes of the State of Michigan. According to the decisions of our Supreme Court, the Attorney General of the State of Michigan is vested with common law powers to abate public nuisances, and this power has been used at various times by the Attorney General to eliminate water pollution situations prior to the enactment of our present water resources act in 1929.

"Because of the importance of water pollution law enforcement, I sponsored a conference on this subject on November 2, 1965, in Lansing, Michigan. A copy of the proceedings of that conference is appended and it can be observed that it was attended by State and local officials, by private citizens and industry, and also by members of the Federal Water Pollution Control Administration."

And I believe, Mr. Stein, you were one of the notable persons that attended that conference.

(Which said document, entitled "Water Pollution Law Enforcement Conference," follows this statement, commencing on page 205.)

"CONSTITUTION AND WATER POLLUTION CONTROL LAWS

"The people of this State, in adopting a new Constitution in 1963, spoke in no uncertain terms on their determination to protect the waters of our State from destruction and corruption.

"Section 52 of Article IV of the Constitution of 1963 states:"

And this, I think, is a rather unusual thing to occur in a State Constitution, and this is what it says:

> "'The conservation and development of the natural resources of the State are hereby declared to be of paramount public concern in the interest of the health, safety and general welfare of the people. The legislature shall

STATEMENT OF FRANK J. KELLEY

> provide for the protection of the air, water and other natural resources of the State from pollution, impairment and destruction.'"

"It can be seen from this provision that the people imposed upon the legislature the solemn duty to 'provide for the protection of the * * *, water * * * of the State from pollution, impairment and destruction.' Responding to this command of the people, the Michigan legislature of 1965 amended our basic water pollution control statute, namely, Act 245, P.A. 1929, and thereby strengthened the arm and power of the Water Resources Commission to abate and control pollution of the waters of the State. Section 6(a) of this act defines what constitutes unlawful pollution in the following language:

> "'It shall be unlawful for any person directly or indirectly to discharge into the waters of the State any substance which is or may become injurious to the public health, safety or welfare; or which is or may become injurious to domestic, commercial, industrial,

> agricultural, recreational or other uses which are being or may be made of such waters; or which is or may become injurious to the value or utility of riparian lands; or which is or may become injurious to livestock, wild animals, birds, fish, aquatic life or plants or the growth or propagation thereof be prevented or injuriously affected; or whereby the value of fish and game is or may be destroyed or impaired.'"

This is a very broad definition in our State of what constitutes unlawful pollution.

"In order to facilitate the control and banning of the discharge of raw sewage, this act was amended by the addition of Section 6(b), which provides:

> "'The discharge of any raw sewage of human origin, directly or indirectly into any of the waters of the State shall be considered prima facie evidence of the violation of section 6(a) of this act unless said discharge

> shall have been permitted by an order, rule or regulation of the commission. Any city, village or township which permits, allows or suffers the discharge of such raw sewage of human origin into any of the waters of the State by any of its inhabitants or persons occupying lands from which said raw sewage originates, shall be subject only to the remedies provided for in section 7 of this act.'"

The purpose of this section was to make it a prima facie act of unlawfulness to discharge raw sewage into any of the waters of the State.

"But, beyond this, the legislature of 1965 desired to make it more positive that the Attorney General should have his time-honored common law powers to abate a public nuisance and thus provided in Section 6(d) as follows:

> "'Any violation of any provision of section 6 shall be prima facie evidence of the existence of a public nuisance and in addition to the

remedies provided for in this act may be abated according to law in an action brought by the attorney general in a court of competent jurisdiction.'"

"Indeed, in recent days the Attorney General has made use of this power in several suits brought against polluters who could not be stopped in their continuing acts of pollution by the Water Resources Commission. The 1965 amendment to this act strengthened the arm of enforcement by declaring in Section 10 that a violator (municipalities excepted) of the provisions of Section 6 shall be 'guilty of a misdemeanor and upon conviction be punished by a fine of not less than $500 and in the discretion of the court, it may impose an additional fine of not less than $500 per day for any number of days during which such violation occurred.'

"Such a fine was recently imposed upon and collected from a large industry in our State. But to make certain that the polluter would be made to pay damages for injuries to the natural resources of the State, the 1965 amendment added the following sentence to Section 10:

"'In addition to the minimum fine herein specified, the attorney general, at the request of the department of conservation, is authorized to file a suit in any court of competent jurisdiction to recover the full value of the injuries done to the natural resources of the State by such violation.'"

"The Attorney General of the State of Michigan has for many years filed suits for the collection of damages caused to the fish and wildlife of the State by identified discharge of pollutional substances into various waters of the State. The purpose of this language was to reaffirm and make certain the exercise of this authority.

MAGNITUDE OF MICHIGAN'S TASK TO PRESERVE GREAT LAKES

"This conference deals primarily with the pollution situation and problem of Lake Michigan. Michigan touches four of the five

Great Lakes. She has more than 3,000 miles of Great Lakes shoreline. The Lake Michigan shoreline extends from Menominee to the Straits of Mackinac in the Upper Peninsula, and from the Straits of Mackinac in the Lower Peninsula down to the southern boundary, a distance of 1,022 miles. It is also interesting to point out that the entire State of Michigan lies within the Great Lakes Basin and consequently all of its rivers flow into one of the Great Lakes. I make this observation in order to point out the tremendous responsibility which my State has in preventing and controlling the pollution of the Great Lakes and the tremendous task which this entails. But since the waters of the Great Lakes are one of the richest assets which my State has, it should not and will not shrink from meeting its responsibility.

"MICHIGAN'S POLLUTION CONTROL PROGRAM

"The water pollution control program which the State of Michigan has pursued and will continue to plan and enforce in the future will be delineated to you in great detail by the excellent staff of the Water Resources Commission and the Department of Public Health. I believe you will find from a review of the record that these two public agencies have worked indefatigably and diligently in performing this stupendous task. Granting that much more needs to be done, may I assure you that this great State will not be found wanting in the performance of this task.

"MEETING OF ATTORNEYS GENERAL ON LAKE MICHIGAN POLLUTION PROBLEM

"On November 3, 1967, at the request of the Honorable William G. Clark, Attorney General of the State of Illinois, Attorney General LaFollette of Wisconsin, Attorney General Dillon of Indiana, and I met in the offices of General Clark in Chicago for the purpose of conferring about the Lake Michigan pollution problem. Inasmuch as the Attorneys General of these States are ultimately responsible for the enforcement of the water pollution control laws of their respective States, it was believed that they ought to agree upon a cooperative program for the enforcement of such laws in these States. The result of that meeting was verbalized in a statement issued at that time, a copy of which is attached."

(A copy of the proceedings referred to follows this statement, commencing on page 360.)

"You will observe, Mr. Secretary, that the Attorneys General of each State agreed that they would secure from their respective States a list of all polluters of Lake Michigan, that these lists would be exchanged so that each Attorney General would know who were the polluters that needed to be identified along the entire shore of Lake Michigan for the purpose of taking such steps as may be necessary, either singly or in concert, against such identified polluters.

"Inasmuch as this conference was called by you shortly after this meeting, the information which I would have received from our State agencies has been compiled for the purpose of this conference and will form the basis for further action to be taken not only by me, but by the Attorneys General of the other three States. I assure you that there will be further joint activities by the four Attorneys General of these States, and that it is the intention of all of us to prosecute vigorously all legitimate cases against polluters who refuse to comply with the water pollution laws of these States.

"RESEARCH PROGRAMS OF UNIVERSITY OF MICHIGAN ON GREAT LAKES

"In Michigan our two great universities, the University of Michigan and Michigan State University, have for years been engaged in research and scientific study of the waters of the Great Lakes and their tributary streams. The University of Michigan has conducted a far-flung and intensive research program on the Great Lakes through its Great Lakes Research Division, Institute of Science and Technology, headed by Dr. David C. Chandler. Just recently, the Great Lakes Research Division of this University has published its Special Report No. 30 entitled 'Studies on the Environment and Eutrophication of Lake Michigan.' I am filing a copy of this volume with you and your staff and additional copies may be secured from Dr. Chandler. In fact, Dr. Chandler stands ready to supply you with all the documents and papers they have prepared from their research work, and to be available for consultation at all times."

I am happy to announce that Dr. Chandler is here in person at this Conference.

MR. STEIN: Mr. Olds, do you want that document of Dr. Chandler's as an exhibit?

MR. OLDS: Yes. Here it is.

MR. STEIN: That will be designated as an exhibit and will be available at the Washington office of the Department of Interior and the Regional Office in Chicago for inspection during business hours.

(Which said document, entitled "Studies on the Environment and Eutrophication of Lake Michigan," is marked as Conference Exhibit No. 1, 1/31/68, and is on file at the Federal Water Pollution Control Administration office in Washington, D.C., with a copy on file at the regional office of the FWPCA in Chicago, Illinois.)

MR. OLDS: Thank you, Mr. Stein.

"Also, recently on December 4, 1967, Dr. Chandler as Director of the Great Lakes Research Division of the University of Michigan presented a 'Statement Before The Chicago Field Hearings by Panels on Basic Science and Environmental Problems of the Commission on Marine Science, Engineering and Resources' dealing with 'pressing problems of pollution abatement and water resource management of the Great Lakes.' Dr. Chandler's division has also prepared and supplied me with a document entitled 'Monitoring of Great Lakes Waters' in which he proposes a general program of monitoring this tremendously large body of fresh water so that determination could be made of what occurs from time to time. Copies of both of these documents are attached to this paper."

Copies of those are attached to this paper.

MR. STEIN: Those documents will be entered into the record as if read.

(Copies of the documents referred to follow this statement, commencing on page 361.)

"A mere study of these publications and documents would indicate the complexity of the waters of the Great Lakes, how little is known about their behavior and how much more needs to be found out. It would seem that if we are going to approach intelligently the problem of controlling the pollution of Lake Michigan, the research program and activities of this division of the University of Michigan not only should be maintained but, in fact, should be stepped up. I am alarmed by information given me by Dr. Chandler that his research program is in danger of being seriously reduced by the present threat of Federal cutback of funds. If this occurs, he will not be able to continue this program at the present level, and he will be required to reduce his staff and efforts.

"At a time when we are concerned and alarmed about the pollution of Lake Michigan, this would be highly unfortunate and thus I urge you to use your good offices to the end that the funds that are needed for this research program will not be reduced but, hopefully, augmented.

"GREAT LAKES WATER POLLUTION LABORATORY

"During fiscal 1964 the Congress of the United States not only authorized but appropriated funds for the construction of a water pollution control laboratory to be built in Ann Arbor, Michigan. According to information I have received from Senator Philip A. Hart, the construction of this laboratory was to begin during the fall of 1964--in fact, the site had already been selected."

And I am informed that the site actually was donated by the University of Michigan.

"This much needed research facility, to be known as the Midwest Federal Water Pollution Control Laboratory' was to do research for all the Great Lakes Region, with respect to the pollution wastes that were being discharged into the waters of the Great Lakes and what should be done to render them either innocuous or at least less injurious.

"The reason why Ann Arbor, Michigan, was selected for the site of this laboratory was so that the basic data collected by the Great Lakes Research Institute of the University of Michigan and other universities in the Great Lakes Region could be utilized by the laboratory in its research program. Scientific information and data are of little value unless they are converted into useful purposes. It was hoped that this facility would find the answers to the many complex problems that confront us in

STATEMENT OF FRANK J. KELLEY

our efforts to free the waters of the Great Lakes from the burden of pollution now carried by them.

"We hope, Mr. Secretary, that action will be taken immediately to begin the construction of this most important research facility on the site which has already been selected at Ann Arbor, Michigan."

And I might say parenthetically here that we are certainly heartened by the letter read, received from Senator Hart, on this matter.

"Research Program of Michigan State University on Tributary Rivers.

"Michigan State University has also engaged in research programs involving the waters of the State of Michigan. Inasmuch as the University of Michigan developed and had been carrying on an extensive research program on the Great Lakes themselves, Michigan State University, through its Institute of Water Research, devoted its attention to the waters in the tributary streams systems. It is these streams that receive a large share of the pollutants that find their way into the Great Lakes and in this instance into Lake Michigan. I am including herein a letter dated 24 January 1968 which I received from Milton E. Muelder, Vice President, explaining the nature and extent of this research conducted by Michigan State University. I should like to direct your special attention to the paragraph in this letter referring to the demonstration project which when put into operation would 'evaluate methods of removing the entire nutrient-rich effluent of a disposal plant from the receiving stream. This or comparable types of waste handling may become essential to all communities of the State to prevent our wastes from reaching and adversely affecting the Great Lakes.'"

(A copy of the letter referred to follows this statement, commencing on page 389.)

I believe this Conference will deal rather extensively with this problem of enrichment ment of the waters of Lake Michigan.

"As it is believed that one of the most troublesome problems of Lake Michigan arises out of the discharge of nutrients into its waters causing growth of inordinate quantities of algae and diatoms, then certainly this project of Michigan State University ought to be supported to the fullest extent. Until an economic way is found by which algae-producing nutrients are removed from sewage and other wastes containing them, it is vain to hope that the waters of the Great Lakes can be free from this pollutional burden.

"Vice President Muelder in his letter states that 'The material on all such research projects is being gathered together in one area under the sponsorship of the Institute of Water Research. All this data and information would be made available to you and any public official having a responsibility in this area.

"You may rest assured that the agencies of the State of Michigan charged with this responsibility shall work very closely with the research experts of the University of Michigan and of Michigan State University in an effort to find the solutions that we so desperately need at this time.

"ALEWIFE PROBLEM--

JOINT STATE AND FEDERAL RESPONSIBILITY

"In recent years and particularly last summer the Lake Michigan shoreline of the State of Michigan was inundated with an explosive population of alewives. These gathered upon the beaches of our State and of the other States on Lake Michigan and created a dirty, smelly, putrescent mess of dead and rotting fish which endangered the health and welfare of persons who owned property along this shore and the members of the general public who made use of private and public facilities.

"It is estimated that the tourist business of Michigan suffered a loss of at least $50 million dollars last summer because of this invasion. I am informed by officials of the Conservation Department that this species of fish found its way into the Great Lakes via the ocean being lifted up to the reaches of the Great Lakes through the locks and the canal facilities comprising the older and newer St. Lawrence Seaway and the connecting channels."

Now, I have also been informed that these were planted in the Fingerling Lakes in New York and that maybe this is where they originated. In any event, they are here and the problem is before us.

"Consequently, neither the State of

Michigan nor any person is responsible for their invasion and multiplicitous growth during recent years.

"However, since they entered the waters of the Great Lakes through navigational facilities constructed by the Federal Government, it would seem that certainly there is here a Federal responsibility. In a sense, this mass of dead and putrescent fish along the shores of Lake Michigan during the summer months constitutes a pollution problem about which both Federal and State Governments should be concerned.

"The Michigan Department of Conservation has evolved a program for cleaning up the expected recurrence of this problem during this summer which will cost approximately $827,000. On January 16, 1968, I addressed a communication to the Honorable George Romney, Governor of the State of Michigan, recommending that there be budgeted on behalf of the State of Michigan one-half of this sum as its share of the funds that will be needed to pay for the cleanup work which will be necessary. It seems to me that in view of Federal responsibility the United States ought to fund the other half of the total bill. Attached is a copy of my letter to Governor Romney."

(A copy of the communication referred to follows this statement, commencing on page 393.)

"In further explanation of this program by the Michigan Department of Conservation, I am attaching hereto a clipping which appeared in the Whitehall Forum, White Laker, dated January 4, 1968."

(A copy of the clipping referred to follows on pages 395 to 399.)

"Since you are concerned at this hearing with the protection of the health and welfare of citizens of these four States surrounding Lake Michigan, I urge you most seriously to allocate either from present available Federal funds or from some new appropriation, the 50 percent Federal share needed to clean up this miasma which will invade our shores in the forthcoming summer months.

"CONCLUSIONS

"In conclusion, Mr. Secretary, may I

STATEMENT OF FRANK J. KELLEY

say that I appreciate this opportunity to appear here at this conference and to express the concern that we have in Michigan over the condition of the waters of Lake Michigan.

"As I have previously stated, my State has a large stake in maintaining the waters of this lake in as clean and pure a condition as can be produced by the science and ingenuity of men.

There are many complex problems that assail us in our task of achieving these results. To solve them will require the cooperation and combined efforts of all sectors of our society, the Federal Government, State and local units of government and, of course, the private citizen. I believe that the people of Michigan are making their desires known: namely, that they expect public officials, as well as private citizens, to exert every effort to achieve the goal of restoring and maintaining the waters of Lake Michigan in as clean and pure and wholesome a condition as is attainable.

"May I assure you, sir, that I shall cooperate with you to the fullest and shall use all the powers of my office as provided by law towards the achievement of this most desirable goal."

Thank you.

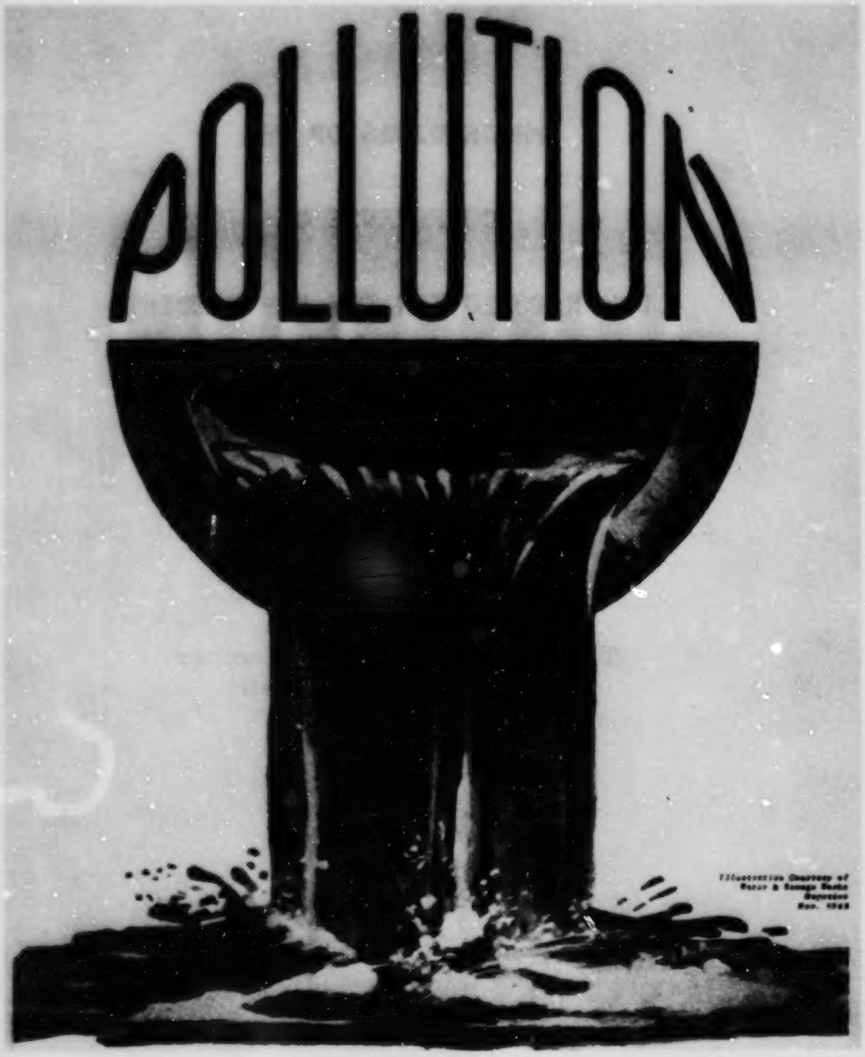
MR. STEIN: Thank you, Mr. Olds.

(Applause.)

MR. STEIN: I don't know how you did it, Nick. Either you hypnotized them or you put them to sleep, but at least you got them quiet. I hope by the applause that you hypnotized them.

(The documents and communications referred to in the statement of Attorney General Frank J. Kelley are as follows:)

WATER



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Water & Sewage Works
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LAW ENFORCEMENT
CONFERENCE

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- DEPT. OF RESOURCE DEVELOPMENT, M.S.U.
- WATER RESOURCES COMMISSION

NOV. 2, 1965 CIVIC CENTER LANSING, MICH.

PROCEEDINGS OF THE

CONFERENCE ON

WATER POLLUTION LAW ENFORCEMENT

November 2, 1965

Terrace Room, Civic Center
Lansing, Michigan

Sponsored By:

Frank J. Kelley, Attorney General, State of Michigan

Water Resources Commission

Department of Resource Development of
Michigan State University

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PROGRAM

CONFERENCE ON

WATER POLLUTION LAW ENFORCEMENT

Sponsored by

ATTORNEY GENERAL FRANK J. KELLEY

WATER RESOURCES COMMISSION

DEPARTMENT OF RESOURCE DEVELOPMENT OF
MICHIGAN STATE UNIVERSITY

November 2, 1965
Terrace Room, Civic Center
Lansing, Michigan

9:30 INTRODUCTORY REMARKS
Frank J. Kelley, Attorney General of the State of Michigan.

9:45 REVIEW OF MICHIGAN'S WATER POLLUTION LAWS AND ADMINISTRATION
Nicholas V. Olds, Assistant Attorney General

10:00 THE ROLE OF THE LEGISLATURE IN ABATEMENT OF POLLUTION
Rep. Joseph M. Snyder, Chairman of House Committee on Conservation, and Sen. Carl W. O'Brien, Chairman of Senate Committee on Conservation.

10:30 RECESS

10:45 MUNICIPAL RESPONSIBILITIES IN WATER POLLUTION LAW ENFORCEMENT
Louis C. Andrews, Jr., Staff Attorney, Michigan Municipal League.

11:00 TOWNSHIP RESPONSIBILITIES IN WATER POLLUTION LAW ENFORCEMENT
Joseph A. Parisi, Jr., Executive Director, Michigan Townships Association.

11:15 COUNTY RESPONSIBILITIES IN WATER POLLUTION LAW ENFORCEMENT
Chester C. Pierce, Attorney for Office of Wayne County Drain Commissioner.

11:30 THE ROLE OF THE FEDERAL GOVERNMENT IN WATER POLLUTION CONTROL LAW ENFORCEMENT
Murray Stein, Chief, Enforcement Branch, Division of Water Supply and Pollution Control, Public Health Service, Department of Health, Education and Welfare, Washington, D. C.

12:00 DISCUSSION

12:30 LUNCH

2:00 THE ROLE OF THE SCIENTIST IN ENFORCEMENT OF WATER POLLUTION CONTROL LAWS
Dr. Leon W. Weinberger, Director of Research, Water Supply and Pollution Control, U. S. Department of Health, Education and Welfare, Washington, D. C.

2:30 RELATION OF WATER POLLUTION LAW ENFORCEMENT TO INDUSTRIAL OPERATION AND DEVELOPMENT
Thomas J. Powers, Dow Chemical Company, Ford T. Shepherd, Vice President, The Mead Corporation, and John A. Moekle, Associate Counsel, Office of General Counsel, Ford Motor Company.

3:45 DISCUSSION

4:15 SUMMARY REMARKS
Frank J. Kelley, Attorney General of the State of Michigan.

4:30 ADJOURN

WATER POLLUTION LAW ENFORCEMENT CONFERENCE

November 2, 1965

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INTRODUCTORY REMARKS

By
Attorney General Frank J. Kelley

We wish to welcome all you gentlemen to Lansing and express our gratification at the excellent turnout. I hope that the program we have arranged will be productive and enlightening. On October 2, when President Johnson signed the Water Quality Act of 1965, he made the following significant statements:

> "The clear, fresh waters that were our national heritage have become dumping grounds for garbage and filth. They poison our fish, they breed disease, they despoil our landscapes.
>
> "No one has a right to use America's rivers and America's waterways that belong to all the people as a sewer. The banks of a river may belong to one man or one industry or one state, but the waters which flow between those banks should belong to all the people.
>
> "There is no excuse for a river flowing red with blood from slaughterhouses. There is no excuse for paper mills pouring tons of sulphuric acid into the lakes and streams of the people of this country. There is no excuse -- and we should call a spade a spade -- for chemical companies and oil refineries using our major rivers as pipelines for toxic wastes. There is no excuse for communities to use other peoples' rivers as a dump for their raw sewage.
>
> "This sort of carelessness and selfishness simply ought to be stopped; and more, it just must be reversed. And we are going to reverse it."

During this year's session of our State Legislature, amendments to the Water Resources Act were adopted which considerably strengthened the authority of Michigan's Water Resources Commission to control and, in fact, put a halt to many instances of pollution which previously were beyond the reach of that agency. An entirely new definition of unlawful pollution was incorporated in these amendments which include factors not previously considered important.

In a sense this was an up-dating of our basic Water Pollution Control Act

However, it is one thing to have a law on the books and quite another thing to enforce it, because enforcement of water pollution control laws steps on many tender toes.

While there is universal support for the elimination of pollution, there is often resistance when enforcement directly affects vested interests. Much of this resistance is caused by a lack of understanding concerning this problem. Consequently, I felt that it was time that we summoned a conference on this most important aspect of our water pollution control laws, namely, the ENFORCEMENT OF THE LAW ITSELF.

In organizing this conference I decided that in all fairness it should include those who are responsible for enforcing these laws; also, those concerning whom enforcement action might be taken. However, I would like to stress the word "RESPONSIBILITY." All of us -- those who administer the laws, as well as those who must abide by them -- have RESPONSIBILITIES towards the public to obey these laws voluntarily so that the desired objective of restoring and keeping our waters clean be achieved with a minimum amount of coercion.

It is with this thought in mind that I requested participation by municipal, township and county officials and also participation on the part of representative industries in our state.

You will also notice that the federal government now plays a very important role in the control of the pollution of the waters of the nation. It has been the position of the officials of the State of Michigan that the primary responsibility for the enforcement of pollution control laws resides in the state and that the state should meet this obligation without any hesitation or equivocation.

In our appearances before congressional committees, we have been assured that so long as the states measure up to their responsibilities, they need have no fear of federal intervention; but, on the other hand, we were warned that should we fail in this duty, congress would have no hesitancy in preempting the field. Consequently, I have invited Murray Stein, who is the Chief Enforcement Officer of the Division of Water Supply and Pollution Control of the United States Public Health Service. Mr. Stein comes to us with many years of experience in this work. He has conducted hearings under the federal act all over the country and has performed his job squarely and fairly. I think he will have some rather interesting things to tell us at this conference.

May I welcome you this morning and hope this conference will be enlightening and will arouse public awareness in the problems that we face in our joint task of keeping Michigan's waters as clean and as pure as humanly possible. For unless this is done, the phrase "Michigan is a Water Wonderland" might have to be altered to "Michigan is a Water Wasteland!"

REVIEW OF MICHIGAN'S WATER POLLUTION LAWS AND ADMINISTRATION

By
Nicholas V. Olds
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Scope and Purpose:

One of the main objectives of this conference is to explore the legal aspects and problems involved in the abatement and control of pollutional discharges into the waters of the State. It is hoped that by doing so, not only those of us attending this conference, but the general public will have a better understanding and awareness of the legal structure undergirding the enforcement of our laws prohibiting the contamination of our waters.

We are all against pollution in the same way that we are all against sin, but too often we give scant attention to the correlative or reciprocal rights affected by the enforcement of water pollution control laws. Because of this lack of understanding, officials charged with the responsibility of administering water pollution control machinery are too often unjustly criticized for the apparent lack of action and results.

When Persuasion has Failed - Importance of Enforcement:

No public official having a proper sense of public relations will precipitously and without adequate efforts of persuasion start actions against a citizen or municipality of the State to compel the elimination of a pollutional discharge. The language in both our State and Federal statutes on this subject, either inferentially or directly, requires the use of conciliatory machinery before putting into motion the wheels of enforcement. In the instance of the Michigan Water Resources Commission, after an investigation has revealed the existence of unlawful pollution, the person or entity responsible is advised of the situation and every effort is made to convince it to voluntarily eliminate the improper pollutional load imposed by him into the receiving waters. Although the art of persuasion proves successful in many instances, we must never lose sight of the fact that the agency administering the pollution control of this State must always have the power to enforce its decisions should no agreement be reached which would eliminate the pollution.

In the words of Teddy Roosevelt, a pollution control agency must always "speak softly, but carry a big stick." Without this residue of legal power, the efforts of a pollution control agency can flounder and its efforts be nullified so that the pollution of the waters of the State continue merrily on.

Enforcement Tools Should be Kept Sharp - Jurisdictional Disputes and Uncertainty Should be Avoided:

An agency charged with the responsibility of keeping the waters of the State reasonably clean should be given adequate and ample power to perform its public task. Its tools of enforcement should be constantly clean and sharp so that there can be no misunderstanding about its intention fully and fairly to enforce the pollution control laws adopted by the State Legislature. Some pollutors would enjoy nothing better than protracted delays involved in the settlement of jurisdictional questions and disputes.

One can imagine the time and work that could be consumed in resolving a jurisdictional dispute as to whether the State or the Federal government had jurisdiction over the pollution situation, whether the State agency or the municipality had jurisdiction, whether the administrative hearing complied with all the nicsties of due process of law, whether in fact (and this has been urged in many of our cases) the State had any authority to compel a municipality, for instance, to cease discharging untreated wastes in a particular river on the specious grounds that other municipalities and other pollutors were doing the same. I have even heard the challenge made by municipal officials to this effect:

> "Well, the State has gotten its court order, now let's see how it is going to enforce it."

Therefore, let us be clear about this. No pollution control program of any state can be worth the paper on which it is written unless there is precise, clear cut and unambiguous authority to enforce the decisions that are duly and legally made by the pollution control agency.

Common Law Doctrine Affecting Abatement and Control of Water Pollution:

Although it may be rarely recognized, the fact remains the common law had well developed legal doctrines by which pollution of public waters could be either abated or controlled. The two doctrines, 1. Nuisances, both private and public;[1]

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[1] The Doctrine on Nuisances is aptly expressed: "Sic utere tuo ut alienum non laedas." Use your own property in such a manner as not to injure that of another.--Black's Law Dictionary 4th edition.

2. The riparian right of reasonable use; could be and were utilized in many cases to enjoin and prohibit a pollutor from continuing his unlawful practices.

Since each state of the Union inherited all the sovereign authority previously exercised under the common law or under the civil law each state therefore has inherent legal authority which, if exercised, could and many times did control and abate pollution of public waters which were of such a character as to amount to a public nuisance. Also, every riparian owner on a stream or lake has the legal right to insist that other riparian owners desist from contaminating the waters in such a way as to render them less useful and in fact injurious to the complaining riparian owner. Thus a riparian owner could make use of both doctrines, that of private nuisances, and that of the right to the reasonable use of the waters contiguous to his lands.

I shall illustrate the utilization of these doctrines in two cases which reached the Supreme Court of our State several decades ago.

In 1909, the Attorney General of the State of Michigan, on behalf of the Township of Wyoming and the Village of Grandville, filed a suit against the City of Grand Rapids for an injunction to prohibit that city from continuing to discharge its raw, untreated sewage into the Grand River.[2]

During flood stages the Grand River would innundate and contaminate the land areas near these communities. The attorney general utilizing his common law powers filed a suit in the Superior Court of the City of Grand Rapids to compel that City to abate the nuisance which it was creating. Oddly enough the Superior Court dismissed the bill of the attorney general but fortunately on appeal the Michigan Supreme Court not only sustained the bill of complaint but granted both a prohibitory and mandatory injunction. In its opinion the Supreme Court laid down some very fundamental principles that have been the loadstar of our State pollution control program ever since.

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[2] Attorney General ex rel Township of Wyoming v. City of Grand Rapids, 175 Mich 503 (1913).

1. A municipal corporation has no greater right to pollute the waters of a river or watercourse, or to create a nuisance therein, than has any individual.
2. And if such a municipal corporation creates a nuisance through the discharge of its sewage into a watercourse, it may be restrained therefrom.
3. There can be no prescriptive right to create a public nuisance. Although such prescriptive rights can be operative against an individual riparian owner, it is never operative against the public and no prescriptive right comes into being to increase the discharge of pollutional substances or to increase the nuisance resulting.
4. The rights of the riparian owners on a stream to the use of the water are property rights. Such rights cannot be restricted, limited, or destroyed by permitting, through statutory enactment or otherwise, a municipal corporation to discharge its sewage into the river above them. Such riparian rights can only be acquired through the exercise of the right of eminent domain and by making full compensation to the owner.
5. It is not essential that the nuisance create a condition intolerable to the persons affected by it. If there is a degree of annoyance to them, or public health is affected,, an injunction will issue.
6. The fact that the health and convenience of one part of the public, or of a particular municipality, will be best subserved by discharging sewage into the stream constitutes no legal defense.

The mandatory order issued by the Supreme Court occurred in 1913, but it wasn't until the 20's that the City of Grand Rapids built a sewage disposal plant for treatment of its municipal wastes. When the plant became inadequate in the 1940's, the Stream Control Commission[3] issued an order requiring the construction of further facilities. Failing to comply with this order, the attorney general filed a suit in the Superior Court for the City of Grand Rapids for its enforcement, and shortly after the issuance of a decree on April 24, 1952, the City of Grand Rapids did construct facilities that were then necessary.

This is a prime example of the intelligent and successful utilization by state officials of both the common law and statutory powers and establishment of a body of legal criteria for the abatement and control of pollution of the waters of the State.

The Application of Reasonable Use Doctrine In Water Pollution Control

With the growth of industry in our State, the discharge of industrial waste soon became a serious threat to the maintenance of the purity of our waters. As I have noted previously, the discharge of pollutional substances in a stream or lake could cause serious injury to lower or other riparians and there is an extensive body of law for the redress of such injuries. Over the years, many suits have been filed by private riparian owners for injunctions to restrain a harmful discharge of waste by an upper riparian proprietor. The most notable case that reached the Michigan Supreme Court was

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[3] Act 245, Public Acts of 1929

Monroe Carp Pond Company vs. River Raisin Paper Company, 240 Mich 279, which occurred before the enactment of the Stream Control Commission Act of 1929.

The River Raisin Paper Company began discharging paper wastes into the River Raisin in Monroe County thereby depleting the oxygen in the water to such an extent that all the carp belonging to the Monroe Carp Pond Company died and rendered the pond useless. The Pond Company filed suit for an injunction and for damages. The Michigan Supreme Court in its opinion based its decision on language from a Massachusetts Case, Parker v. American Woolen Company, 195 Mass 591:

> "We regard it however as settle that no riparian proprietor has the right to use the waters of a natural stream for such purposes or in such a manner as will materially corrupt it to the substantial injury of a lower proprietor, or to cast or discharge into it noxious and deleterious substances which will tend to defile the water and make it unfit for use."

In discussing the law of reasonable use as between riparians, the Michigan Supreme Court stated (page 285)

> "(b) The right to the use of the water in a stream by a riparian proprietor is not absolute. It is a natural right, qualified and limited by the existence of a like right on the part of others. It is an incident to the ownership of the land through which the stream passes. The enjoyment of such use by a landowner is prior to those below him, and subsequent to those above him, on the stream. The water may by his use be rendered unfit for many purposes for which pure water is suitable, and yet the lower riparian proprietor may have no just cause for complaint, if its condition results from a reasonable use thereof in accordance with the common right."

However, in deciding whether to grant the injunction to restrain the River Raisin Paper Company from discharging paper wastes into the river, it utilized another doctrine known as "balancing the equities." Indicating that under the common law the issuance of an injunction is not a matter of right but a matter of grace, the Court reviewed the comparative economic importance of these two commercial enterprises to the community of Monroe and found that the economic impact of the paper mill was far superior to that of the carp pond operation. In those days the Court was also faced with the fact that the science and technology of waste disposal had not yet advanced sufficiently to enable the paper mill company to render the waste innocuous. In fact the Court in its opinion observed that there "is no way in which these wastes can be treated and purified on their own premises so as to permit the plants to be operated with reasonable profit." Consequently, the Court refused to issue an injunction because to do so would put the paper company out of business. As an alternative, by finding that the pollution of the waters was unreasonable and a wrong, it awarded full damages to the Carp Pond Company. May I hasten to say at this juncture that under our Water Resources Act so called "economic feasibility" is not a factor. The statute defines what is unlawful pollution and authorizes the Water Resources Commission to order a cessation of the discharge of any substance into the waters of the State which violate this definition. The Water Resources Commission may but need not consider the economic feasibility of either abating or restricting a discharge of substances which violate the definition.

Statutory Enactments:

State Health Commissioner Authority

The first significant water pollution control statute in Michigan was Act 98, Public Acts of 1913, which was fundamentally amended by Act 219 of the Public Acts of 1949. The purpose of this statute was to vest in the State Health Commissioner supervisory authority over the construction of water supply and sewage disposal systems by municipalities. This law had its genesis in a long history of epidemics attributable to water-borne diseases. Its chief purpose was to authorize the State Health Commissioner to examine and approve plans submitted by municipalities for the construction of sewers, sewage plants or water supply systems so that they would be designed and function in a manner which would prevent occurrences of water-borne disease epidemics. Under this act, the State Health Commissioner has authority to refuse to grant extensions or additions to a sewer system when in his judgment the municipality is not adequately treating the sewage then being delivered to its system. It was this prohibitory authority which the State Health Commissioner exercised several years ago when he placed a "ban" on all additional sewer connections proposed in various parts of Wayne County. His refusal to lift the "ban" brought on a rash of law suits between subdividers and municipalities in Wayne County in which the State Health Commissioner was named a party. Out of this maze of legal complexities there came into being agreements among municipalities, including Wayne County, with respect to the construction of additional sewage disposal facilities. Thereafter, the Commissioner lifted his "ban" against the extension and construction of additional sewers.

But, I want to note here the important part that the law played in this situation and particularly call your attention to the fact that it was not until the State Health Commissioner brought out his "big stick" by imposing a "ban" that the Gordian knot finally was cut. The result was that municipalities came to agreements which brought about joint participation in the construction of much needed additional sewage disposal facilities.

At this point mention should also be made of the fact that the act under which the State Health Commissioner functions makes no provision whatever for the control, regulation and abatement of waste from industry or commercial establishments. His authority is restricted to the supervision of municipal functions in this field and then only when the public health is involved.

Creation of Stream Control Commission

State wide concern over the extensive pollution of our waters engendered enactment by the State Legislature of Act 245, P.A. 1929 which created the Stream Control Commission. This body was made up of the director of conservation, the state health commissioner, the state highway commissioner, the director of agriculture and the attorney general. It contained a definition of unlawful pollution and authorized the commission after conducting a statutory hearing to issue orders controlling and regulating the discharge of pollutants. An appeal from the commission's orders was permitted to the Courts, and it authorized the attorney general to start such actions as were necessary to enforce the orders of the commission. By the device of designating the heads of various state agencies as ex-officio members of the commission, the legislature brought about co-operative efforts among existing state agencies to abate the pollution of our waters. With limited budget this commission assembled a staff and worked diligently during the 1930's and 1940's in making investigations, issuing orders and securing court enforcement of those orders. Shortly after its organization, Mr. Milton P. Adams became its executive secretary, and as we all know, Mr. Adams has carved for himself a national and international reputation in this very important aspect of keeping our waters reasonably clean and pure.

One of the most important series of cases the Stream Control Commission spearheaded were the so-called Port Huron Cases. Before the beginning of World War II the City of Port Huron had refused to comply with an order issued by the Stream Control Commission to

> "proceed with the construction of a sewage treatment plant and the necessary collecting and intercepting sewers, pumping stations, force mains and other appurtenances in connection therewith, all when and as approved by the Michigan Department of Health to permit treatment for the sewage of the City before its discharge to state waters."

Again like in the Grand Rapids Case, the lower court turned down the suit filed by the attorney general for the enforcement of the commission's order. This of course was reversed by the Supreme Court and in doing so the Court laid down some rather important guide lines, such as:

> "It is no defense to a statutory charge of river water pollution that others have contributed or are contributing to that condition.

> "In proceeding to compel city to construct a sewage treatment plant and to stop discharging raw sewage into adjacent rivers wherein city claimed other cities were also polluting the waters, the doctrine of comparative injury is inapplicable since it should be confined to situations where plaintiff can be substantially compensated. (1 Comp. Laws 1929, Sec. 278, et seq.)
>
> * * *
>
> "The doctrine of comparative injury should not be invoked to justify the continuance of an act that tends to impair public health.
>
> "Alleged financial inability of city to comply with stream control commission's order to construct a sewage treatment plant and to cease polluting rivers by discharging raw sewage therein is no defense to such order, since a city has the power to raise money by taxation. (1 Comp Laws 1929, Sec. 278, et seq.)
>
> "Fact that war conditions make it more difficult for a city to comply with order of stream control commission to construct a sewage treatment plant and to cease polluting river waters by discharging raw sewage therein merely affects the time within which there should be compliance with the order. (1 Comp. Laws 1929, Sec. 278 et seq.)"

But, this did not end the battle for the City of Port Huron was faced with a serious financial situation. When the treasurer of the City of Port Huron refused to sign the bonds to be issued for the financing of the ordered facilities, the Mayor filed a mandamus action to compel him to perform his duty. The issue was whether the city had legal authority to borrow money which would require the levying of taxes in excess of that authorized by the statutes or charter. In its opinion, the Supreme Court made it abaundantly clear that in this instance the City was performing a task which it had been ordered to do by court decree, that its responsibility was not a local one but "was for the protection of the people of the State of Michigan. It transcended local purposes." Consequently the court stated that it was no longer necessary for the city to submit the question of issuance of the bonds to the electorate because the people in their collective capacity in a municipality had no more right to pollute the waters of the State than an individual citizen. This landmark case cleared the path for the financing of the construction of sewage disposal systems by municipalities pursuant to a court order, and in financial parlance, these bonds became known as "court order bonds." In fact, they commanded a much more favorable rate of interest than either general obligation or revenue bonds. Thereafter, no municipality could complain that it did not have the financial ability to issue bonds for the construction of these works. Many of our suits against municipalities for the enforcement of commission orders have been mainly for the purpose of enabling municipalities to issue "court order bonds." It was due to this financial breakthrough that many of our Michigan municipalities have been able to construct sewage disposal systems for the first time in their history and it has not been necessary for the state as such to provide financing for this purpose.

Creation of Water Resources Commission

In 1949 the Legislature amended the Stream Control Act of 1929 in various respects. It not only changed the name, but expanded the membership to include 3 citizens appointed by the Governor, 1 from industry, 1 from municipalities and 1 from conservation organizations. The attorney general was dropped as a member. A new subsection was added to Section 8 which required the commission's approval before any person could make a new and additional use of the waters of the State. This broadly based commission organization has worked effectively and well since control and abatement of pollution of our waters affects a great variety of uses and interests.

Miscellaneous Statutory Authority

Although the State through its agencies has been active in the prevention of the pollution of the waters of the State, the fact that authority of a similar nature exists in municipal entities must not be overlooked. For instance, townships, incorporated villages, fourth class cities, home rule cities, drain commissioners and other political entities have authority in one form or another to prevent the pollution of waters existing within their territorial limits. It is not my purpose here to delve into the details of this authority because it is expected that other people on the program will do so.[4]

Constitutional Limitations:

A brief word should be said about the requirements and restrictions of both the State and Federal Constitution affecting the issuance and enforcement of administrative orders. Our State's 1963 Constitution specifically grants the right of appeal from the issuance and enforcement of an administrative order.[5] The Administrative Procedure Act[6] as well as the provisions of the Water Resources

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[4] See Act 246 P.A. 1945, as amended by Act 55, P.A. 1959.

[5] Article VI, Sec. 28, 1963 Constitution.

[6] Act 197 of the Public Acts of 1952.

Act very specifically require the holding of hearings before the issuance of any order. The due process clauses of both the State and Federal Constitution would certainly apply to the issuance of orders and the prerequisite of a proper and adequate hearing. It should not be forgotten that whenever a state agency imposes a restriction on the discharge of pollutants in a body of water, it is dealing as was stated in the Monroe Carp Pond Case, with the property rights of riparian owners and to the extent these property rights are being affected by any order, the greatest care should be exercised in the conduct of hearings followed by the issuance of proper and legal orders.

Administrative Machinery and Procedure:

The Water Resources Act, as amended, defines unlawful pollution in Section 6, and Section 7 sets up the procedure for hearings and the issuance of orders. Section 8 (a) provides for the method of appeal from an order of the commission. Also rules of procedure were adopted pursuant to the Administrative Procedure Act, Act 197 of the Public Acts of 1952, and every effort was made in adopting these rules to afford the alleged polluter with a fair and impartial hearing. When the commission believes that the hearing will be a protracted one, it may be referred to a hearing representative who will make a record and return it to the commission with his findings of fact and conclusions of law. Based on this record the commission will hear the whole matter and make its final determination.

Enforcement of Commission Orders by Court Proceedings:

The attorney general by general statutory enactment has the authority to file any proceedings in any court for the enforcement of the laws of the State. The Water Resources Act as amended specifically authorizes the attorney general to enforce the orders of the commission. Many suits have been filed over the years to enforce the orders of both the stream control commission and its successor, the water resources commission. Of course, it should be emphasized that in many cases compliance with these orders was made without the necessity of filing a court action. A list of such cases would be too cumbersome to append, but details could be secured from the offices of the attorney general and water resources commission. I am appending, however, tables indicating the number of administrative orders issued by the commission against industry and municipalities and the number of conferences and hearings conducted by the commission from the year 1949 to date.

Recent Amendments to the Water Resources Act and Their Significance:

I will not go into great detail, however, I do want to emphasize two aspects of these amendments. The definition of unlawful pollution in Section 6 has been considerably expanded. Specific mention is now made to injuries

> "to domestic, commercial, industrial, agricultural, recreational or other uses which are being or may be made of such waters or which is or may become injurious to the value or utility of riparian lands."

By this language we can reach and abate potential pollution. It need not be shown that the polluter is actually discharging a substance, but if he is about to do so, his actions can be halted before the injury occurs.

Subsection (b) was added to Section 6 making it a matter of prima facie evidence that the discharge will violate the act if it consists "of any raw sewage of human origin." This subsection also imposes upon municipalities, such as cities, villages and townships, a responsibility to control the discharge of human sewage by any of its inhabitants. In too many instances, municipalities would raise the defense that it was the inhabitants, directly through their septic systems, who were discharging the offensive sewage rather than the municipality through its sewer system. Inasmuch as these municipalities have police powers and can pass ordinances regulating public health and safety, they ought to be made responsible for what their inhabitants do to the waters of the State.

Section 10 is a new section which incorporates in statutory language what we have been doing under the common law, that is, compelling polluters to pay damages for the injury which their act occasioned to fish and wildlife. The conservation department with the assistance of the attorney general's office during the past 15 years has been collecting damages of this kind. What the Legislature did by adding this section is ratify in statutory form the common law authority to collect such damages.

Control of Pollution of International Waters:

Since Michigan has a long international water boundary with Canada, we have had many instances of pollution of these waters of a transboundary nature. The Boundary Waters Treaty of 1909 between the United States and Canada makes it unlawful for one country to pollute boundary waters to the injury of persons or property of the other. But the treaty sets up no machinery for the enforcement of this provision. By various references this international body has made investigations and recommendations for control of the pollution of these waters. By and large these recommendations have been carried out by the use of the authority of the States and Provinces concerned and the commission maintains boards to constantly study and review progress and new problems as they arise. In 1961 the International Joint Commission issued a brochure entitled "Safeguarding Boundary Water Quality--A Cooperative Effort Between United States and Canada Under International Treaty" describing the work the International Joint Commission had done. Recently the IJC received a reference to study and make a report on the pollution of Lake Erie containing recommendations for measures to be taken by the two governments to reduce the pollution of this lake.

Conclusion:

This, in brief and in fact in very inadequate form, is the legal history of water pollution control activities of the State of Michigan so that its waters will be preserved and protected not only for the present but for future generations. We have done a fairly good job, but we cannot rest on our laurels. Pollution of the waters of the State takes on many shapes and forms. We must continue to exercise our best and most diligent efforts in this task of preserving the purity and quality of our waters upon which man's continued existence and civilization so much depends.

WATER RESOURCES COMMISSION

ADMINISTRATIVE ORDERS

			FINAL ORDERS	
YEAR	INDUSTRIAL	MUNICIPAL	INDUSTRIAL	MUNICIPAL
1949		5	3	6
1950	5	8	7	34
1951	5	2	16	23
1952	9		2	14
1953	6		2	
1954	11	1	6	2
1955	26	2		
1956	29	1		2
1957	25	2	2	
1958	20	1		5
1959	28	1	1	4
1960	25	2	3	2
1961	73	4		1
1962	73	5		2
1963	71	20	1	3
1964	81	29	1	
1965 to date	78	7	3	3
TOTAL	565	90	47	101

WATER RESOURCES COMMISSION

YEAR	NUMBER OF CONFERENCES	NUMBER OF STATUTORY & PUBLIC HEARINGS
1949	9	12
1950	89	36
1951	49	21
1952	15	21
1953	32	9
1954	38	5
1955	47	
1956	15	3
1957	11	2
1958	17	8
1959	24	6
1960	11	14
1961	11	3
1962	4	6
1963	20	8
1964	13	2
1965 to date	42	10
TOTAL	447	166

THE ROLE OF THE LEGISLATURE IN ABATEMENT OF WATER POLLUTION

By
Joseph M. Snyder, Chairman
House Committee on Conservation and Recreation

Attorney General Kelley, distinguished panelists, guests and delegates; my subject today is "The Role of the Legislature in Abatement of Water Pollution." I do hope my views do represent the composite point of view of many individuals charged with the serious challenge of fostering legislation to correct a festering problem, and one that is growing at a constantly accelerating pace.

The legislature if it is to be successful in its efforts must keep itself apprised of public desires. In abating water pollution, as in many other issues, it is important to equate the attitudes of the general public and the special interest groups. This is no small task, for there are many different attitudes and many degrees of intensity in those attitudes. Often times some of the attitudes and conclusions are based on emotion and misinformation, making the problem and its solution more complex and difficult.

"Water pollution" is an expression most of our citizens use in the same sense as they do "motherhood", the flag, and the good old college alma mater. No one disagrees and it is the right thing to say now days that we must keep our waters from becoming polluted. However, most people have no particular interest in water pollution abatement until they are personally affected and then they may demand to know, why their problem wasn't anticipated and prevented by appropriate legislative action. It's difficult to convince them that it's easier to prevent water pollution than it is to correct the resulting widespread damage.

While many of you in this assembly have been pioneers and voices in the wilderness, water pollution control has only recently assumed major importance in the public mind and even yet there are many people who are only mildly concerned and yes, there are even those who have an uneasy feeling when confronted with circumstances that will require new laws, new methods and new restrictions.

There can be many conflicts raised even in a legislator's mind when approached by the divergent interests -- shall he give credence to the relatively few who sometimes represent the special interest groups or shall he give weight to the opinions of the contacts exerted by the general public. Yes, a legislator must be aware of all these immediate interests; a legislator must also be a man of vision and look beyond the immediate problem or beyond even the immediate normalcy and well-being in a given situation.

With this great diversion of opinion and variety of thought, a legislator may be hard pressed to determine what he can believe and of what he can defend or to the extent he must compromise to gain his objective. Too often, a distinction must be made between that which is attainable and that which is ideal. Really, that is the problem that confronts us today in the area of water pollution abatement.

At one extreme are those who honestly advocate putting our streams and waters in such a state of purity that one can safely dip and drink from them. At the other extreme are those who believe even our present restrictions are confiscatory. Who is right -- probably neither. We then as legislators, must pursue a course that will result in a preservation of our resources and enjoyment of life -- yet one that will also protect our economy and provide for life itself.

Too long the emphasis has been on economic interests and now we must provide the essential balance and correct some of our past errors. How fast can improvements be made? What will happen if too drastic legislative action is taken? What will happen if strong enough action is not taken? These are the decisions we must make.

The legislator must keep himself as well-informed as possible within the limits set by the total range of demands on his time. Our legislative sessions give us a variety of subjects, ranging from astrology to zoology. It is not unusual to debate the coordinate points of the earth, brucellosis and bangs disease all in the same afternoon. I don't claim to be an expert on all these subjects but I do know where to find the answers. Not only do we rely on our committee system, but we can turn to our resource people and administrators for help. I'm not the least bit hesitant in picking up the telephone and asking Nick Olds or Loring Oeming for advice when the waters get a little cloudy. They represent a good many years of collective experience and judgment. My job is to translate their wisdom into workable statutes -- laws that will protect the public trust and interest.

Once the die is cast, the legislator must convey the substance of his knowledge and efforts to his constituents and defend if necessary the action he takes. Very rare are the instances when a new law is acceptable to everyone. Like some medicine, it is bitter to take but the results are good once we are persuaded that the medicine must be swallowed, and water pollution abatement is no exception.

In arriving at his decisions, the legislator must also balance the many pressing needs of the State with its finances. He must allocate for the administration of water pollution control recognizing that there are also serious unmet problems in Mental Health Education, Public Health, and other areas. Sometimes even his best laid plans are disrupted by expected and unexpected executive vetoes.

We must be willing to seek new methods and new techniques in our legislative processes. Because of the wide range of the uses of water, a variety of bills are introduced at each session and referred to different legislative committees.

During this past year we had water bills referred to the Conservation Committee, the Judiciary Committee and the Committee on Public Health. This procedure makes it difficult to coordinate objectively and it is quite possible for inconsistencies to develop. Some method of coordination of water resource bills may have to be found. In the reorganization of the Executive Branch of government, this problem was recognized and the Water Resources Commission, the State Waterways Commission and the Boating Control Commission were all put under the cloak of the Department of Conservation.

We must also provide for continuity of thinking on matters of

Water Conservation and Control. A state policy on water resource development and control could be identified by the legislature as a guide to future legislatures and administrators. Such an effort might well include a review of existing water resource legislation to determine any necessary appropriate revision.

A legislator must be knowledgeable of the efforts of government at all levels in abating water pollution. I'm sure that we have in this assembled group, representatives from townships, cities, counties, the state and federal governments. In each of these units there are activities in water resource management that must be coordinated. And in each we hear familiar phrases such as biochemical oxygen demand, nutrients, effluent discharge, etc.

Government must be willing to accept and encourage voluntary efforts if it appears that these are sincere and effective. If ever there was an endeavor worthy of a tripartite effort this is it. Industry, Government and the Citizenry can all join in the drive to abate water pollution. There is enough work there for all. We must pool our knowledge and finances. Too many splinter programs will defeat their own purposes.

And now, I would like to depart from my script for a few minutes and relate a few recent personal experiences.

This past summer, without too much fanfare and publicity, our committee in the House made a concerted effort to study water pollution. We took a boat trip up and down the River Raisin. Ladies and gentlemen, let me tell you that you must see to believe the condition of that water. It was impossible for any form of life to survive there. Not only do we have a problem in the River Raisin, but this river empties into the beach along Lake Erie where we have one of our finest state parks, one of the most beautiful sand beaches in the State of Michigan and in the country -- and this beach is unusable. The nutrients added to the water create an algae growth that destroy not only the wildlife and fish, but they create a condition on the shores that make them unusable.

I had the experience the other day of looking at the other end of the pendulum. I went to Alpena and saw the efforts of the Atibbi Corporation. They were voluntarily putting millions of dollars into a program that will attempt to control water pollution. I found out a real exciting and interesting thing on this trip. Their efforts were not completely successful because when their water was finally processed to the best of their ability, an organic substance still remained which could only be removed by the addition of nitrogen, and obviously this would create an additional nutrient and create further problems. However, it was pointed out to me that the City of Kalamazoo has now embarked on a program in cooperation with its paper mills in which there will be a cooperative effort, and the nitrogen necessary to remove the organic substance will possibly be derived from the sewerage used in the Kalamazoo disposal plant. This is an exciting solution because it solves two problems.Probably we can't be overly optimistic, but I'll tell you that as long as there is the sincerity and the desire to work out problems between these two groups, perhaps we can come up with a solution and I assure you that our committee will be going up there to look over the problem.

House Concurrent Resolution No. 150 has been passed in the House and Senate and both Senator O'Brien, the chairman of the Senate Conservation Committee, and I are members of this joint committee. We feel this will be one of the most important committees we will be asked to serve upon, and I am looking forward to getting into the problem of water pollution. I might point out that many industries are making an effort to voluntarily correct water pollution. The oil industry, paper mills, and recently I read an article in the official Michigan magazine, that even Chrysler has now developed a process in which they will burn their wet solids. These are new and dramatic processes available to us. As a legislator, I would welcome any practical ideas this assembled group may have, because remember that a good bill in its final form is a simple idea fostered by an individual such as yourself. All we do to your ideas is to add a little parsley to make the banquet plate look attractive. Give us the ideas and I tell you that we have an enlightened legislature that is looking forward to working with the attorney general's office and many groups in the state to resolve the matter of water pollution. In essence, I feel this is the responsibility and the role of the legislature in the abatement of water pollution. Thank you.

THE ROLE OF THE LEGISLATURE IN ABATEMENT OF POLLUTION

By
Senator Carl W. O'Brien, Chairman
Senate Committee on Conservation

Well, I'm going to be mercifully brief. You have just listened to three politicians, two lawyers and Frank Kelley doubling in brass and I know that the human soul, not to mention the human behind, can take only so many politicians and so many lawyers in a row. I'd like to tell you a few little things. I am not an expert on any of this. I see a lot of you experts out there -- people from Trout,Unltd. people from the conservation clubs, city managers. In fact, I get the feeling I know about half of you. You know it's an ominous feeling, and I am speaking time after time to pretty much the same people. I have said this so frequently. Speaking in the area of pollution -- in fact I see the city managers of a couple of cities I represent, so maybe I better watch what I say.

Next time I am going to introduce a bill which will restore the language that was kicked out of Senate Bill 69. Senate Bill 69 was two or three different bills over the year. In the beginning when the bill was put in, some fellow had a little lake up in one of these counties. He thought it was polluted and he grabbed a section of the law and wrote a bill which said you can't do that. It wasn't much of a bill but it was a good vehicle for changing the Water Pollution Act of 1949. I called Nick Olds and asked if he could come over to my office and talk to my committee. We have a little water pollution discussion going on, and in less time than it takes to tell you, Nick Olds was there. We said, "Nick, with your 20 years of experience in the courts, would you tell us what you think would be the ideal bill for water pollution -- the best bill of any state in the United States? Do you have any solution?" And Nick said, I just happen to have a few hundred thousand words on the subject." Indeed he did, and he educated us.

There was one phrase in that bill which was very dear to me. It said something like -- any substance you put in the water which changes the chemical, physical or environmental characteristic of the water is pollution. That didn't last long. You know, maybe if you start the ideal bill -- the ideal situation -- then you get a pretty good bill. And I think that's what we did this year, because one by one the people whom this bill would affect, came and made their recommendations, some of them rather heatedly, some of them quite logically, and told us what aspects of the bill they couldn't live with. This is good. This is proper lobbying.

I think the important thing the legislature did this year was that it said to municipalities, to industry and to every septic tank home owner in this state -- all at once we are aware of this pollution problem and if it is not stopped, get ready to stop because we can't live with it.

In the old days of history, I understand civilization just picked up and moved when a place became polluted. The evidence is there for you gentlemen who know the ancient history of the world. The evidence is still there, and I can tell you by the leavings of humanity, how many years, how many decades, how many centuries these people lived in one spot. What is the history of the United States going to be? Indeed, the Western World?

As I remember the passage of Senate Bill 69, there was a long fight, and an interesting thing happened. There was a man from industry who was fighting water pollution. They won't listen to it. It costs too much money. It wasn't efficient. It wasn't necessary. There was the river and if you put "stuff" in it, there it goes. And that's the way he liked it until finally with civilization and culture moving in on him, industry and cities and municipalities, when the water got down the stream to his industry, it was so polluted he couldn't use it in his own plant. And then he said -- "What's wrong with you guys in the legislature, why didn't you do something?" Because, then it was his problem. It wasn't his problem as long as somebody was drinking it or trying to use it for recreational purposes. but when at last he couldn't use it in his own plant, then it became a personal problem. I think this is what really has to happen to all of us. This man was no more selfish, nor more ignorant than you or I. Some of us live a little closer to the problem because it has affected our favorite sport. We see the streams. The fish go out. Attorney General Kelley has a photograph here which shows many dead fish. We see this happen all over the state. Those of us in conservation know it all the time. We hear about it every time it happens. Unlimited examples, a man like Nick Olds could give you. Absolute death through pollution.

When I was a kid I swam in a lake, lived on a lake, right in the middle of the city. During the last election that lake smelled so badly that everybody in public office could not sleep at night because of telephone complaints about the smell. So, we had the Water Resources Commission come down and look at the three lakes that were affected and they found a heavy influx of industrial oil. I could have told them that because when I was a teen-ager, one of our favorite pastimes, there was so much industrial oil on one of those lakes, was to go down with some of the kids and set fire to the lake. Ever see a burning lake? There were other industrial wastes in it -- raw domestic sewage -- I forget the exact chemical analysis, but I am sure it must have taken a long time, there was so much "junk" in that lake. And now, of course, that city like three other communities in the area I represent, received their orders -- stop -- make a change. Change the bad sewer systems, the old combined sewers.

So now we come to the crux of the problem -- money. The state has recognized its responsibility when it said, as it did in Senate Bill 69 this year, as it is going to keep on saying by strengthening these pollution laws, to municipalities -- "Stop polluting our inland lakes and streams." Now, the state must take the next logical step.

There are communities which, quite frankly, are hard pressed to live up to these orders and yet it must be done. So what is the state to do? The state must somehow arrange financial aid to communities such as the Village of Lake Orion. This small village has to construct a million and a half dollar sewer system, and it has 400 taxpayers. Divide that million and a half plus the interest on it into 400, and it is going to cost several thousand dollars for every home owner in that village. They will be paying more than their homes are worth. If the state does not recognize its responsibilities to these communities after it has told them what has to be done, then the state is negligent. And I want to tell you something. I don't think this legislature was that kind. I was very happy this year -- very happy -- to see the grade of men that came to the legislature, like Representative Snyder, men knowledgable, well informed. I think I got a college education this year and I got one in pollution, I'll tell you that. So, I think one thing we are going to have to do is study the financial implications of our fight against pollution, and you are the people who are going to have to help us. You know where we came from. We came from ward politics. We are not Ph.D's when we get up here. But, maybe when the politician does get here, it is because he has an instinct for doing what those communities and what this state feels should be done. And I think now the sentiment is ripe for doing the thing. A war has begun and war is expensive. We have, as a matter of fact, appropriated fifty thousand dollars from the Senate. The House appropriated fifty thousand dollars and the federal government matched it with one hundred thousand dollars so people like Representative Snyder, myself and the other legislators who will serve on this commission could have a director and staff to study in depth and detail the problems of the communities and industries of the State of Michigan.

Well, ladies and gentlemen, and I'm happy to see there are some ladies here because when matters of public health and the welfare of the community come into being, I notice the ladies are generally more effective than those of us of the male sex, so I am happy to see that there are a few women here today and they are becoming interested in what programs may be developed to fight pollution in this state.

I would like to leave you with a thought -- there are eight million little polluters in the State of Michigan today and in twenty years there are going to be fifteen million of us. So this is the battle we have. Thank you.

MUNICIPAL RESPONSIBILITIES IN WATER POLLUTION LAW ENFORCEMENT

By
Louis C. Andrews, Jr., Staff Attorney
Michigan Municipal League

Cities and villages have been on the firing line in all phases of battle against water pollution arising from sewage disposal for the last quarter of a century. This is not at all surprising as a city government is simply an organization designed to help large groups of people assembled together to function in an orderly and rational basis. When you have large groups of people together, the problems and responsibilities naturally follow and guarding against water pollution is certainly one of the most important.

The difficulty arose in the first place because all of us had to be reoriented on the need for sewage treatment. In former years once the sewage was waterborne and beyond the city limits it became somebody else's problem. This is no longer the case, of course. Now we want to avoid contaminating the water to such an extent that it cannot be used by others and to prevent the destruction of natural resources which are of prime importance to the state and country.

The agency that redirected municipal thinking along these lines is beyond question the Water Resources Commission. The state provided the "strong arm" to redirect municpal thinking along these lines, but unfortunately it never did provide adequate means for cities and villages to finance the huge sums necessary to provide adequately for sewage treatment. In many cases municipal sewage works were financed by virtue of court order bonds as authorized by

Public Act 320 of 1927. Once the court has ordered the installation of the sewage works, the city or village is required to install it and may, when necessary, finance it by the issuance of general obligation bonds over and above its normal bond limits. This sounds like an excellent solution to the problem, but I am afraid that in a great many cases the financial capabilities of some of the smaller cities and villages affected suffered greatly.

As an example, recently a village of some 1800 persons installed a new system costing $630,000. This worked out at about $350 for each man, woman and child within the village. Not only that, it constitutes an expenditure equal to 25% of the assessed value of the village. This is a tremendous sum. As you well know, a village is limited in its tax rate to one and three-quarters per cent per year of its assessed value. Here we have one single expenditure which is the equivalent of the total tax expenditure for a period of some 13 years.

Although this act includes counties as well as cities and villages within its scope, so far as I know there has never been any attempt to require a county to install a sewage treatment plant, nor would we expect the problem to be attacked from this direction normally. The centers of population are the ones that are primarily the generators of sewage, they are the ones that should be responsible for installing sewage treatment plants, but they should receive all possible assistance in this endeavor from the state.

This has been the direction in which municipal efforts have been directed. We have had no great problem in regulating the acceptance of sewage wastes. Principally in the recent past the emphasis has been upon the construction of treatment plants, and although I have no special knowledge in this particular field, it would seem to me that the record of Michigan cities and villages should be admired throughout the United States. We now have no city or village over 5,000 population which does not have at least a primary sewage treatment plant. As I have indicated, the expenditures for this purpose have been huge and they have been steady for the last approximately 30 years with the exception of the wartime years when the materials were not available.

I note during the same period of time that there does not seem to be quite as much progress made on a national basis. One recent article indicating that in 1942 there were 75,000,000 people in the United States served by sewage treatment plants and that today 118,000,000 are served by sewage treatment plants. However, during the same period of time the population which is without sewage treatment has also increased -- 60.6 million in 1942 to 68 million in 1962. Thus I think when we in Michigan can say that substantially all of our urban population is served by sewage treatment plants that we are entitled to at least some feeling of satisfaction, even though we realize there are many problems yet to be solved.

As I have previously indicated, the enforcement of municipal regulations regarding the disposal of sewage is generally not solved as a legal question, but rather on the administrative level. In other words, if it is possible for the sewage treatment plant to treat the sewage or industrial waste, then the municipality wants to be able to accommodate the producer of the sewage or waste. However, cities have had detailed ordinances governing the subject of sewage disposal for a considerable number of years. A Committee of the Michigan Municipal League studied the model sewage ordinances which were available in 1952 and produced their own recommended version. This has served as a forerunner and guide to many municipalities in their own sewage disposal ordinances in the intervening years.

This type of ordinance is primarily concerned with:

1. Requiring a sewage connection
2. Regulating the construction and placing of the connection
3. Regulating the type and quantity of waste received.

Subsequently, many cities have been interested in further prohibiting the introduction of storm waters into sanitary sewers. Also we find that many engineers would like to have these ordinances spell out the restrictions on what may be placed in the sewers in greater detail. Some of the prohibited uses can actually be permitted, they point out, if the waste is allowed to enter the sewers in small controlled quantities. This presents us with the age old problem of making the prohibition sufficiently simple and definite to satisfy legal standards for a penal statute and at the same time recognizing that there may be exceptions which can be made under certain circumstances. Where waste requires special treatment, most of these ordinances meet the situation with what might be called an "escape" provision. This is the provision which authorizes special agreements for the treatment of such waste for extra compensation.

One of the reasons that there is little difficulty in enforcing these ordinances is that the producer of waste which may cause a problem is usually of a size or character which makes him stand out like a sore thumb. In checking this source out, it is the usual routine matter and it can readily be determined whether it will be necessary for him to develop a preliminary treatment facility, whether a special agreement for extra treatment expense will be necessary, and so forth.

Occasionally when a sewer line is first extended someone who already has a working septic tank will object to the requirement that he hook up to the new sewer. This is usually more of an annoyance than a serious threat to enforceability of the ordinance. This is usually a matter of public relations more than anything else.

We are trying to make this sewage treatment ordinance a little more elastic by adding what we sometimes call an escape provision, that is a provision for a special agreement to treat wastes which do not conform to the requirements of the ordinance. In other words, if an industrial plant, plating plant has a waste which is too highly acid, we might make a special agreement with that industry that will treat it but they will have to pay a sur charge for the privilege of dumping it into the sewage system. There have been other developments in this sewage ordinance in recent times, and you will find in the most modern ordinances, some additional provisions. They relate primarily to the placing of the wastes in the system which contain certain metals, and the ones that I see most frequently have certain parts per million of iron, zinc, cyanide, copper or chromium. Among other additional prohibitions which have recently come into vogue in a number of ordinances is the restriction against using any radio-active wastes in the system. All of the ordinances contain the usual prohibition against dumping in wastes that are too hot, too greasy or that contains flamable liquids or which contains solids large enough to obstruct the sewer. I think that indicates pretty well what the ordinance enforcement possibilities are in the cities and villages.

Summing up, I would like to point out to you that although the municipalities can't take too much credit for the initiative in this field, the initiative is all with the State. Nevertheless, they have taken it tremendously forward in the past 25 years and have expended huge sums of money in order to provide treatment for industrial wastes. Secondly, I would like to point out to you that the tendency, the direction in which municipalities are going as far as enforcement is concerned, is to provide whatever treatment is necessary to take care of the wastes generated. There is no tendency so far as I can see to attempt to prohibit the generation and dumping of this waste into the treatment plant where if at all possible they will accept and treat it. Thank you.

TOWNSHIPS' RESPONSIBILITIES IN WATER POLLUTION LAW ENFORCEMENT

By
Joseph A. Parisi, Jr., Executive Director
Michigan Townships Association

In cooperation with John H. Bauckham of Kalamazoo, Legal Counsel for Michigan Townships Association, I am pleased to present to this conference, the Townships' responsibilities for Water Pollution Law Enforcement.

At the outset I want to assure this Conference that the association which I represent, is in complete accord with water pollution programs, presently under study.

Our principle concern, however, is in the matter of financing any obligations which will be imposed by Federal or State Statutes, or a combination of both.

This presentation deals with ordinance making powers of the townships, financing and joint contracts with other municipalities, as well as with existing industry.

1. Ordinance Powers

In addition to the township board being designated a board of health with authority to control sources of sickness and disease (M.S.A. Sec. 14.63), Michigan Public Act 39 of 1963 (5.45 (1)) authorizes the township board to adopt ordinances regulating "public health." It is generally felt that this ordinance power would extend to all phases of the regulation of public health and makes the board of public health and makes the board of health provisions rather surplusage. Under such ordinance powers it is our opinion that the township board by resolution at a regular board meeting could prohibit the contamination and unhealthy pollution of lakes and streams within the township. The only requirement is that the ordinance be published within ten days after adoption in a local newspaper and recorded in an ordinance book within seven days after above publication.

In addition to the foregoing statutes a township is empowered to adopt a building code under Michigan Public Act 185 of 1943 (M.S.A. Sec. 5.2971 (1)). Under this statute it can adopt any standard code by reference and without the necessity of publishing the entire code in the local newspaper. Such a code could well provide for proper sewage treatment of industrial waste through individual private systems or through a public system.

The power of the township to adopt zoning regulations also bears on their authority in this field. A zoning ordinance can be adopted under Public Act 184 of 1943 (M.S.A. Sec. 5.2963 (1)). The enabling portion of the statute on this subject authorizes the township to adopt provisions pertaining to the "Sanitary safety and protective measures that shall be required for such dwellings, buildings and structures." In addition the zoning ordinance is to be based upon a plan which among other things deals with the "conservation of ... natural resources." In this regard, a township would be able to restrict the location of certain trades and businesses thereby prohibiting them from bordering a lake or stream. In addition they could regulate the use being employed of property and premises with a view to proper waste disposal and sewage treatment.

2. Financing

The township has the right to enforce all of its ordinances through its own police department, through a contract with the county sheriffs' department, and/or through building and zoning inspectors. All ordinances can provide for a fine of up to one hundred dollars and ninety days in jail for each day that a violation exists. The fines do not inure to the benefit of the township and the township must support any of its enforcement agencies from the general fund of the township or from a special police protection assessment district which can encompass either a portion or all of the township. In this regard legislation would be helpful that would permit the townships to retain fine money at least for violations for local township ordinances.

The other financing problems are concerned with the construction of public sewers and sewage treatment plants. Under Act 312 of 1929 the township is authorized to join with other municipalities in incorporating a metropolitan authority with independent taxing and bonding powers. Such authorities can be incorporated for the purpose of sewage treatment. The Revenue Bond Act, which is Act 94 of 1933 (M.S.A. Sec. 5.2731) is also of assistance in this matter. It permits townships to build sanitary sewers and treatment plants under revenue bond proceedings which in practice may be coupled with special assessment proceedings for the sewer mains constructed in the streets. The special assessment proceedings are most frequently commenced under Act 188 of 1954 (M.S.A. Sec. 5.2770 (51)). All such bonding proceedings of course must be approved by the Michigan Municipal Finance Commission. Obviously for a revenue bond proceedings to be successful there must be available sufficient connectors to a system to support the bond issue. The bond obligation is retired from service charges made against connectors to the system. Revenue bond proceedings can be initiated by the township board whereas special assessment proceedings are initiated by petition of the owners of not less than fifty-one percent of the property within the district as finally established. In townships that have more than five thousand population special assessment proceedings can be initiated by the township board without this petition. However, if owners of twenty percent of the land oppose the proceedings then the board must revert to the fifty-one percent petition.

Act 342 of 1939 (M.S.A. Sec. 5.2767 (5.1)) and Act 185 of 1957 (M.S.A. Sec. 5.570(1)) authorizes the township to contract with the county for sewage treatment and sewage systems. Under these acts the township can pledge the full faith and credit of the township in support of any obligations necessary to be issued by the county and can raise funds to pay these obligations by taxation without limitation, by simple board action, by special assessments, by rates and charges against users and by other available funds. The taxation authority is further supported by article nine of 1963 Michigan Constitution at section six. These acts are very useful and with the proper attitude on the board of supervisors of the county or on behalf of the county road commission depending on which act is followed, the financing of a large project becomes a relatively simple matter. If a county does not have its own treatment system and does not wish to construct one, it may also under these acts contract with a major city within its boundaries that does have such a system for the enlargement of the system into township territories

It is also possible to proceed under the County Drain Commission Act for the construction of storm drainage and sanitary sewer projects. These proceedings are somewhat more complex and in our opinion have no advantage over the proceedings which might be followed under Acts 342 and 185 above referred to.

Except in the case of a contract between the township and the county the township has no authority to tax for a sewage treatment system unless room is available within the fifteen mill limitation or the electors within the township vote to increase the fifteen mill limitation. This presents a serious handicap to townships in the financing of these projects where the county is not involved. Legislation is greatly needed to authorize such taxing authority without limitation where contracts are negotiated with cities and metropolitan districts for such service. Some help has been given charter townships in this regard but unfortunately there are more unchartered townships which do not have this power.

3. Joint Contracts

As previously set forth, townships are authorized to contract with the county for sewage treatment service. In addition, Act 35 of 1951 (M.S.A. Sec. 5.4081) authorizes inter-governmental contracts between any governmental units to accomplish jointly anything which they might accomplish individually. Michigan Public Act 222 of 1949 (M.S.A. Sec. 5.2770(21)) further authorizes a township to contract with industries concerning waste disposal. As previously stated however, the only joint contracts which afford additional taxing power are those contracts with the county. New legislation could well extend this additional authority to other types of joint contracts.

There are several additional statutes which bear upon the question of sewage disposal and treatment and pertain to townships in Michigan. I believe they are for the most part less significant however than the ones to which I have herein referred.

I hope this presentation has contributed to the Conference, whether in a positive or negative sense. Members here are aware that while the will to cooperate is present, the tools with which townships might do the job are somewhat restricted and limited by the statutes, which must be changed.

COUNTY RESPONSIBILITIES IN WATER POLLUTION LAW ENFORCEMENT

By
Chester C. Pierce
Attorney for Office of Wayne County Drain Commissioner

It was only a few weeks ago that Great Lakes senators were told that it would take 20 Billion Dollars over a 10 year period to eliminate water pollution in their region. This report was given by H. W. Poston of Chicago, the federal director for water pollution control in the Great Lakes area. Although water pollution problems are inter-related to air pollution problems as the disposal of various types of industrial wastes by the construction of necessary disposal systems will result in an increased contamination of air, the technology and wealth of our State has to be employed in a coordinated method by the various governmental and individual corporate businesses to reduce pollution drastically.

At the county level, Act 306 of the Public Acts of Michigan of 1927, M.S.A. 14.161 provides that the Board of Supervisors of any county in this State may provide for a County Health Department and it's various activities financed out of the general funds of the county. The plan of organization of a County Health Department is approved by the State Health Commissioner. Section 6 of this act being M.S.A. 14.166, provides that the County Board of Health shall have and exercise the same powers and perform the same duties of a Board of Health as conferred by law upon boards of health of townships, villages and cities. The requirement that all rules promulgated by the County Board of Health are subject to review by the

Board of Supervisors before they shall become effective is further provided in Section 6.

There is a provision in this county act that two or more counties may, by a majority vote of the Board of Supervisors of each county and approval of the State Health Commissioner, unite to form a district health department. One arm of the County Health Department is the division of engineering and sanitation. This division concerns itself with water pollution problems throughout the county. On a county level its usual policy is to notify the offending parties of its findings and recommend remedial action. Such action can take on various forms as the necessity of construction of sanitary sewers, sanitary treatment plants or even quasi-storm water treatment plants. The construction of proper industrial wastes have been found to pollute county streams and are injurious to public health. Although the enforcement provisions of county health laws lack the proper teeth or guidance in order to arrive at an enforcement solution, the County Health Department usually cooperates with the Water Resources Commission to make its findings known where degrees of pollution are present. Compliance with provisions at the local level usually require extended court litigation against private or public corporations who are known to pollute our waters. Against public corporations the remedies are provided in Act 245 of 1929, M.S.A. 3.521 to M.S.A. 3.532, the act creating the Water Resources Commission, and amended by Act 328 of 1965, M.S.A. 3.526, wherein pursuant to Act 320 of 1927, M.S.A. 5.2667, the Water Resources Commission can seek remedies in cooperation with the

County Health Department against any city, village or township in a court of competent jurisdiction in this state. When a governmental unit cooperates in an endeavor to eliminate pollution, results are achieved. An example of use of this type of cooperation was shown through the installation of a five million dollar system in the Township of Grosse Ile through the use of the Water Resources Commission and cooperation of the township and drain commissioner's office. After trial of such matters in the circuit court of said county, the local governmental unit can issue so-called court order bonds for the construction of the proper sewage disposal facility. An example of use of court order bonds litigation was the construction of a million dollar system for the City of Riverview through the use of this chapter. Our courts have held that such court order bonds may be issued and taxes levied for their payment in excess of statutory or charter tax limitations. It is my view that Act 328 of 1965, will permit townships to exceed the 15 mill constitutional limitation on the basis of court ordered bonds as well as Article IX, Section 6 of the Constitution of 1963, wherein the language employed therein states that: "The foregoing limitations shall not apply to taxes imposed for the payment of assessments or contract obligations in anticipation of which bonds are issued." In my view, Public Act 328, a portion of Section 6, Sub-section (c), which reads as follows: "Whenever a court of competent jurisdiction in this state shall have ordered the installation of a sewage disposal system in any township, and the plans therefor shall have been prepared, and approved by the state health commissioner, the township shall have authority to issue and sell the necessary bonds for the construction and installation thereof, including the disposal plant and such intercepting and other sewers as may be necessary to permit the effective operation of such system. Such bonds shall be issued in the same manner as provided for in Act No. 320 of the Public Acts of 1927, being Sections 123.241 to 123.253, of the Compiled Laws of 1948; or any other act providing for the issuance of bonds in townships;" will permit townships to exceed the 15 mill limitations through the use of court ordered bonds. As prior to the amendment of this act, the townships were mentioned but no provisions were employed to provide for the issuance of court ordered bonds and their applications to township disposal plants and interceptor sewer problems. However, it is my belief that under this act and under Chapter 20 of Act 40 of the Public Acts of Michigan of 1956, as amended, our courts would sustain the use of these two acts to exceed the 15 mill constitutional limitation because Article IX, Section 6, of our present Constitution contains the following language: "The foregoing limitations shall not apply to taxes imposed for the payment of principal and interest on bonds or other evidences of indebtedness or for the payment of assessments or contract obligations in anticipation of which bonds are issued, which taxes may be imposed without limitation as to rate or amount....."

A great amount of work in pollution law enforcement and abatement has been accomplished in the counties of Wayne, Oakland and Macomb through the use of Chapter 20 of the Drain Code. Act 40 of the Public Acts of Michigan of 1956, provides a simple method for public corporations, and as employed in that act, it means counties, villages, townships and any other authorities or districts created pursuant to state statutes to build and construct public improvement projects like sanitary drains, storm water drains or sanitary and storm water treatment plants that are necessary to the public health of the various governmental units. In these three counties alone, over one hundred twenty million dollars in public improvement projects have been constructed during the past eight year period. Its companion, Chapter 21, which permits cooperation between governmental units located in adjacent counties has permitted Macomb and Wayne County to construct a semi-storm water treatment facility at a cost of eight million dollars. The advantage of using this act is that county bonds are issued with the full faith and credit of the local governmental units and the full faith and credit of the county pledged for their payment in order to pay for the public improvement to be constructed. Because all these bonds are in the nature of public health bonds, the local units of government are permitted to exceed their statutory and charter tax limitations to retire these bonds. After full payment for the bonds the system becomes a local system. Other acts available to counties are the D.P.W. Act and Act 342 of 1939, or Act 185 of 1957.

Act 222 of 1949, provides for the acceptance of grants or aid to prevent and abate water pollution, M.S.A. 5.2770 (21), Section 1, of that act provides: "As used in this act, unless a different meaning clearly appears from the content: (a) The term 'public corporation' shall be construed to mean any county, city, village, township or metropolitan district, of the State of Michigan, or any authority created by or pursuant to an act of the legislature.

(b) The term 'governing body' shall be construed to mean, in the case of a county, the board of supervisors; in the case of a city, the council, common council, commission or other body having legislative powers; in the case of a village, the council, common council, commission, board of trustees or other body having legislative powers; in the case of a township, the township board; in the case of a metropolitan district, the legislative body of the district; and in the case of an authority, the body in which is lodged general governing powers."

Section 2 of the act provides: "Any public corporation is hereby authorized to apply for and accept grants or any other aid which the United States government or any agency thereof has authorized or may hereafter authorize to be given or made to the several states of the United States or to any political subdivisions or agencies thereof within the states for the construction of public improvements, including all necessary action preliminary thereto, the purpose of which is to aid in the prevention or abatement of water pollution."

Section 3 of said act is unique in that it permits agreements between industries to treat the disposal of industrial waste, and that section reads as follows: "Any public corporation is further authorized to accept contributions and other aid from industries for the purpose of aiding in the prevention or abatement of water pollution and in furtherance of such purpose to enter into contracts and agreements with industries covering the following:

(a) The collection, treatment and disposal of sewage and industrial wastes from industries;

(b) The use and operation by any such public corporation of sewage collection, treatment and/or disposal facilities owned by any industry;

(c) The coordination of the sewage collection, treatment and/or disposal facilities of the public corporation with the sewage collection, treatment and/or disposal facilities of any industry;

(d) When determined by its governing body to be in the public interest and necessary for the protection of the public health, any public corporation is authorized to enter into and perform contracts, whether long-term or short-term, with any industrial establsihment for the provision and operation by the public corporation of sewerage facilities to abate or reduce the pollution of waters caused by discharges of industrial wastes by the industrial establishment and the payment periodically by the industrial establishment to the public corporation of amounts at least sufficient, in the determination of such governing body, to compensate the public corporation for the cost of providing (including payment of principal and interest charges, if any), and of operating and maintaining the sewerage facilities serving such industrial establishment: Provided, That the exercise by any public corporation of such powers outside of its corporate limits shall be subject to the legal rights of the political subdivision within which such powers are to be exercised and shall also be subject to any and all constitutional and statutory provisions relating thereto."

These sections can also be employed with Act 35 of 1951, M.S.A. 5.4081, reading as follows: Section 1. "For the purposes of this act 'municipal corporation' shall mean any county, township charter, township, city or village, school district, metropolitan district, court district, public authority, or drainage district as defined by Act No. 316 of the Public Acts of 1923, as amended, being Sections 261.1 to 278.27, inclusive of the Compiled Laws of 1948, or any other local governmental authority or local agency with power to enter into contractual undertakings."

Section 2. "Any municipal corporation shall have power to join with any other municipal corporation, or with any number or combination thereof by contract, or otherwise as may be permitted by law, for the ownership, operation, or performance, jointly, or by any 1 or more on behalf of all, of any property, facility or service which each would have the power to own, operate or perform separately."

Section 3. "Any municipal corporation shall have the right to contract with any person or any other municipal corporation to furnish to property outside the corporate limits of the first municipal corporation for an adequate consideration, any lawful municipal service which it is furnishing to property within its corporate limits. For the purposes of this section, 'person' shall mean any person, firm, corporation, the United States government, or the state or any of its subdivisions."

Section 4. "Nothing contained in this act shall be construed to grant the right to jointly own or operate a public utility for supplying transportation, gas, light, telephone service, or electric power except as may be provided by the statutes or constitution of the State of Michigan, nor to contract to furnish municipal services outside corporate limits except in accordance with the constitutional limitations on such sale. Nothing contained in this act shall be construed as to grant to municipal corporations acting jointly any power or authority which they do not have acting singly."

Knowing that county government should move ahead to abate water pollution, what type of action is needed. First, I believe the Water Resources Commission should be delegated the sole state agency in charge of water pollution enforcement and legislation be implemented to permit the commission to delegate its enforcement powers on a county regional basis. The Water Resources Commission could establish regional deputy planning and enforcement centers built around county areas with various pollution problems. Industrial counties in close proximity to each other could be grouped together as one area. Agricultural areas with problems like the pickle industry is another deputized area. Each deputy regional director would be responsible for programs to eliminate pollution in his area. I believe also, that the Water Resources Commission should sponsor legislation to broaden the aspects of Act 62 of the Michigan Public Acts of 1963. This is an act relating to industrial development, to authorize municipalities to acquire industrial buildings and sites, to provide for the financing of such buildings by the issuance of revenue, bonds, etc. The act should be amended to include the building of regional industrial or needed waste disposal plants on a regional basis with the lease provisions of the act employed to pay for such plants on a revenue basis. The State Legislature should make available sufficient appropriations for research centers to aid in industrial or agricultural waste disposal methods in the various deputized pollution regional centers. The elimination of water pollution through the collection, treatment and disposal of sewage and industrial wastes from industries on a regional basis can be better accomplished than on a single basis. Tax relief for industry so that waste treatment facilities be free from real and personal property taxation is another measure needed in our state. Air pollution facilities are exempt from real and personal taxation under provisions of Act 250 of 1965, and treatment facilities should be likewise. A combined action from one central authority will be better than unilateral or separate action by various governmental units. Such a law would permit uniformity of control and cooperation with the various units of government and business involved. Approaching the problem of industrial waste disposal on a regional basis would be more economical and practical. As proof of this, Michigan can point with pride at its accomplishments in the field of certification of sewage plant operation. This program has resulted in higher quality and more efficient plant operation.

The Governor of the State of New York has on the ballot today a one billion dollar bond issue for his state to fight pollution. The State of New York, under this program, would contribute 60 per cent of the cost and the local government 40 per cent of the cost to control and eliminate pollution problems. I believe our counties should support such a daring program of state and local government aid and cooperation to eliminate pollution. Such a vast bonding pollution control program could be financed by a water and sewage rate increases on a regional basis or by a combination of methods consisting of water and sewage rates, industrial lease charges, if industrial waste disposal plants were built and an at large one mill regional tax levy for pollution cleanup to benefit regional public health. A repeal of the constitutional prohibition against state credit to local regional governmental units wherein the state could pledge its full faith and credit behind local regional bond issues has also been recommended as a measure to lower the total cost of pollution abatement to local regional units of government.

The time for bold action is here. Michigan----the water wonderland of the world should lead the way.

ENFORCEMENT OF THE FEDERAL WATER POLLUTION CONTROL PROGRAM

By
Murray Stein
Chief Enforcement Officer
Division of Water Supply and Pollution Control
U. S. Department of Health, Education, and Welfare

Federal authority over water pollution has changed dramatically in character and direction in the past six decades. We have progressed in 66 years from the earliest specific water pollution control legislation which considered pollution only as an obstacle to navigation (The Rivers and Harbors Act of 1899) to the most recent water pollution control legislation which has as its stated purpose... "to enhance the quality and value of our water resources and to establish a national policy for the prevention, control and abatement of water pollution" (The Water Quality Act of 1965).

The Federal legislation in the intervening years illustrates the growing national awareness and concern over the increasing pollution of our valuable water resources. At first, water pollution control legislation took a narrow, limited approach to pollution control. Later, a more comprehensive approach was taken which was admittedly experimental, and resulting from this the Federal Water Pollution Control Act was enacted and twice amended.

Three early legislative acts are indicative of the limited approach. We have already mentioned a provision of the Rivers and Harbors Act of 1899 which prohibited the discharge or deposit into any navigable waters of any refuse matter except that which flowed in a liquid state from streets and sewers. The Public Health Service

Act of 1912 recognized the health hazards of pollution by authorizing investigations of water pollution related to disease. The Oil Pollution Act of 1924 was designed to control oil discharges in coastal waters damaging to aquatic life, harbors, docks, and recreational facilities.

Comprehensive water pollution control legislation narrowly missed final enactment or approval in 1936, 1938, and 1940. A landmark year for the Federal program was 1948 with the enactment of the Water Pollution Control Act of 1948, creating the first comprehensive program for pollution control. This law was experimental and originally limited in duration for a period of five years. It was extended for an additional three years, to June 30, 1956.

The Federal Water Pollution Control Act, enacted in July of 1956, was the first comprehensive pollution control legislation of a permanent nature. The Act greatly strengthened and expanded the Federal role, and provided the basis for our present program. The Act was administered by the Surgeon General of the Public Health Service under the supervision and direction of the Secretary of Health, Education, and Welfare. This Act:

1. Reaffirmed the policy of Congress to recognize, preserve, and protect the primary responsibilities and rights of the States in preventing and controlling water pollution;

2. Authorized continued Federal-State cooperation in the development of comprehensive programs for the control of water pollution;

3. Authorized increased technical assistance to States and broadened and intensified research by using the research potential of universities and other institutions outside of government;

4. Authorized collection and dissemination of basic data on water quality relating to water pollution prevention and control;

5. Directed the Surgeon General to continue to encourage interstate compacts and uniform laws;

6. Authorized grants to States and interstate agencies up to $3,000,000 a year for the next five years for water pollution control activities;

7. Authorized Federal grants of $50,000,000 (up to an aggregate of $500,000,000) for the construction of municipal treatment works, the amount for any one project not to exceed 30% of cost, or $250,000, whichever is smaller;

8. Modified and simplified procedures governing Federal abatement actions against interstate pollution; and,

9. Authorized a cooperative program to control pollution from Federal installations.

The Act was amended in July of 1961 to provide for a still more effective program of water pollution control. The 1961 amendments improved and strengthened the Act by---

1. Extending Federal authority to enforcement abatement of intrastate as well as interstate pollution of navigable or interstate waters and strengthening enforcement procedures;
2. Increasing the authorized annual $50 million Federal financial assistance to municipalities, for the construction of waste treatment works;
3. Intensifying research toward more effective methods of pollution control and authorizing the establishment of field laboratories and research facilities;
4. Extending for seven years, until June 30, 1968, and increasing Federal financial support of State and interstate pollution control programs by raising the annual appropriations authorization from $3 million to $5 million;
5. Authorizing the inclusion of storage for regulating stream flow for the purpose of water quality control in the survey or planning stage of Federal reservoirs and impoundments; and,
6. Designating the Secretary of Health, Education, and Welfare, to administer the Act.

The October 1965 amendments, which may be cited as the Water Quality Act of 1965 have considerably enlarged and broadened the scope of the Federal water pollution control program. Yet, consistent with the policy declaration of the 1948 Act, the 1956 Act and the 1961 amendments, the Water Quality Act of 1965 declares the policy of Congress to be "...to recognize, preserve, and protect the primary responsibilities and rights of the States in preventing and controlling water pollution, to support and aid technical research relating to the prevention and control of water pollution, and to provide Federal technical services and financial aid to State and interstate agencies and to municipalities in connection with the prevention and control of water pollution."

The new amendments further strengthen the Federal program by:

1. Creating a Federal Water Pollution Control Administration in the Department of Health, Education, and Welfare;

2. Authorizing a new four year grant program of $20 million each year, for the development of new and better methods of dealing with the pollution problem of overflows from combined storm and sanitary sewers;

3. Increasing the annual appropriations for Federal grants, both single and multi-municipal projects, and offering a 10 percent bonus in the amount of grants for projects which are part of approved metropolitan area plans; and,

4. Providing for the establishment of water quality standards applicable to interstate streams, with the Federal government acting only in the absence of acceptable action by a State with respect to the interstate waters in that State.

Thus, as provided by statute, through Federal, State and local cooperation and coordination, the Federal water pollution control program approaches the complex national problem of water pollution in three ways: technical and financial assistance, research, and enforcement. All stimulate voluntary action. Where such voluntary action is not forthcoming, enforcement authority can make remedial action mandatory. Abatement of pollution, is the aim and purpose of all three of these coordinated program areas.

The enforcement jurisdiction covers pollutional interference with any legitimate water uses. Its application is mandatory at the request of a State Governor, a State water pollution control agency, or a municipality in whose request the Governor and the State agency concur, when the pollution crosses State lines to the detriment of the health or welfare of persons in the receiving State. An enforcement action may be called at the request of a Governor of any State on pollution of interstate or navigable waters which endangers the health or welfare of persons only in the requesting State. Enforcement action must also be taken by the Federal government without State request, when on the basis of reports, surveys, or studies, interstate pollution endangering health or welfare is found to be occurring. The new amendments to the Federal Water Pollution Control Act expand enforcement authority by empowering the Secretary of Health, Education, and Welfare to initiate enforcement procedures whenever he finds that substantial economic injury results from the inability to market shellfish or shellfish products in interstate commerce because of pollution of interstate or navigable waters, and the action of Federal, State or local authorities.

Although enforcement jurisdiction has now been extended, I believe it is a measure of the success of the enforcement program that no changes were made in the enforcement procedures.

I would like to explain these procedures now for those who are not familiar with them, and then discuss some of the enforcement actions we have taken.

Federal authority is asserted in three distinct stages: (1) the conference, (2) the public hearing, and, (3) court action. Each successive step is taken only if the one preceding is unsuccessful in securing compliance with the recommended pollution abatement measures. State action to remedy the pollution is encouraged, and State and Federal interests are fully coordinated.

The conference brings together representatives of the Federal government and the State and interstate agencies concerned. It inquires into the occurrence of pollution subject to abatement, the adequacy of measures taken to abate it, and the delays, if any, that are being encountered. The conferees may agree upon a schedule of required remedial measures, or in the absence of adequate scientific and technical data, may agree that further study is necessary before a schedule is established. The States are encouraged to obtain compliance under their own laws when an agreed upon remedial schedule has been established, and are allowed at least six months to take the necessary actions. If the conferees are unable to reach agreement on a program of remedial action, the Secretary of Health, Education, and Welfare, may issue his own recommendations.

In the event that failure to take remedial action necessitates recourse to the public hearing stage, the alleged polluters, whether an industry, individual or governmental unit are made direct participants before a Hearing Board appointed by the Secretary. Findings are made by the Hearing Board on the evidence presented, and it recommends to the Secretary the measures which must be taken to secure the abatement of the pollution. The Secretary sends these findings and recommendations to the polluters and to the State agencies, together with a notice specifying a reasonable time, which may not be less than six months, to secure abatement of the pollution.

If there is no compliance with the hearing recommendations after six months, the Secretary may request the Attorney General to bring suit on behalf of the United States to secure abatement of the pollution. The written consent of the Governor is necessary to proceed with court action in an intrastate pollution matter.

We consider the conference step of enforcement procedures to be the most important. Even though it is only the first step, it is frequently the only step necessary. Of the 37 enforcement actions held to date, only 4 have proceeded to the public hearing stage, and one of these 4 hearings, that on Corney Creek, was called under the provisions of the 1948 Act, which provided for the hearing as the first step of enforcement procedures. A single case has required court action. This record attests to the success of the conference as a means of determining the pollution problems and stimulating the necessary action to abate pollution.

Any formal statement of how a conference can be called and the statutory requirements of the conference procedure cannot explain what the conference really is and how it really works.

The conference, first and most important, is not an adversary proceeding, although in a few instances the conferees, and these were not the Federal conferees, considered the conference as such. We believe the conference is just what the word says--it is a formal consultation or discussion, and interchange of views, where differences are adjusted. When all parties concerned approach the conference with this view, we find that pollution problems are more openly discussed, mutual concessions frequently made, and detailed plans of action developed. The conference operates informally. No strict rules of evidence are applied and all statements offered are accepted regardless of relevance. Each of the conferees may bring as many people as he wishes to participate in the conference. The participants at any of the conferences represent many different groups or interests. Of course, only the conferees who are the representatives of the Department of Health, Education, and Welfare and the official State and interstate agencies may make the conclusions and recommendations of the conference. The conferences are always open to the public and we have found that public support of pollution abatement programs is an immeasurable aid in stimulating remedial action on the part of industries, municipalities and even Federal installations.

Since the first Federal water pollution control enforcement action was held in 1957, great progress has been made in bringing about the abatement of pollution throughout the country. Every section of the country and many different types of pollution problems have been covered. Several actions have been taken on the major waterways of the country--the Mississippi River, the Missouri River, the Colorado River, the Detroit River, the Hudson River, Puget Sound, Raritan Bay, Lake Michigan in the Chicago-Gary, Indiana area, and Lake Erie, to name a few. We have covered over 7,000 miles of stream at the 37 conferences, and this figure does not include lake and ocean waters.

The pollution problems encountered in these enforcement actions have been of almost every kind, in many different types of waterways, in varying degrees of complexity. Pulp and paper wastes, untreated or inadequately treated sewage, storm sewer runoff, uranium milling wastes, salinity both man-made and natural, textile mill wastes, pesticides and meat packing wastes discharged into small streams, giant rivers, streams with high flow, low flow or both, lakes, bays and ocean harbors, are representative of the problems we have dealt with. These wastes alone or in any combination can, and have created tremendous problems.

At the conference, the Federal government and the offical State and interstate pollution control agencies try to find answers to problems of this sort, and at times we just don't have any. In such instances the conferees have unanimously recommended the establishment of a technical study project to supply the necessary information to develop solutions to the problems.

At present, eight such projects, evolving directly out of the conferences by recommendation of the conferees are in existence. These projects are on the Colorado River Basin, Raritan Bay, the South Platte River Basin, the Upper Mississippi River in the Twin Cities area, in Washington State concerned mainly with Puget Sound, the Monongahela River concerned with the problem of acid mine drainage, the Merrimack River and the Detroit River.

The Detroit River conference and resultant Project provides a fine example of how the conference procedure works and the knowledge that can be developed by a detailed technical study.

The conference on pollution of the navigable waters of the Detroit River and Lake Erie and their tributaries within the State of Michigan was requested on December 6, 1961, by John B. Swainson, then Governor of Michigan. The conference was called by the Secretary of Health, Education, and Welfare, and was held on March 27-28, 1962, in Detroit. The conferees were representatives of the Michigan Water Resources Commission and the Department of Health, Education, and Welfare. The conferees agreed that pollution from various municipal and industrial sources subject to abatement under the Federal Act was occurring in the conference area. They agreed that this pollution caused interference with municipal and industrial water supplies, fisheries resources, commercial and sport fishing, swimming, water skiing, pleasure boating, and other forms of recreation. The conferees then agreed that it was too early to make an adequate judgment on the adequacy of measures taken to abate pollution because of the many gaps in the knowledge of sources and effects of this pollution. It was recommended that the Department of Health, Education, and Welfare initiate an investigation and study to gather data and information on the waters involved, in order to close the gaps in the knowledge of sources of pollution, nature and effects of the pollution, appropriate methods of abatement and appropriate methods to avoid delays in abatement.

A resident study project was established and the work was carried on in close cooperation with the Michigan Department of Health and the Michigan Water Resources Commission. The Project, running 2 1/2 years, staffed by 30 men, and costing $750,000, accomplished what it set out to do. Shortly after the completion of the study, the conference reconvened for a second session on June 15-18, 1965. The Project's findings and recommendations, presented in a definitive report, were adopted by the conferees. The Michigan water pollution control authorities are now vigorously putting the conference recommendations into effect.

The recent conference on the entire area of Lake Erie within the United States presented one of our most difficult pollution problems. The area of water covered by this conference was so large, and concerned so many sources of wastes that two conference sessions held a week apart were necessary to consider the highly complex municipal, industrial, and biological problems. The conference first convened on August 3-5, 1965 at Cleveland, Ohio, and was reconvened at Buffalo, New York, on August 10-12. The States of Michigan, Indiana, Ohio, Pennsylvania, and New York were involved.

The problem of major concern on Lake Erie is that of eutrophication or over-fertilization. Problems are occurring along the Lake shoreline, at some water intakes, and throughout the Lake from algal growths stimulated by nutrients. The Federal report, based on studies of Lake Erie made over the past two years, stated that reduction of one or more of these nutrients can retard or control the algal growths. We are confident that the reduction of soluble phosphates through conventional treatment processes will slow the now accelerated eutrophication to a more natural, normal rate. There is no doubt that control of the pollution of Lake Erie will be a great step forward in preserving and protecting the Great Lakes, our greatest fresh water resources.

The Federal Water Pollution Control Program has made tremendous progress in a few short years. But all this progress is really just a step in the right direction. And while we have been taking steps, pollution of our waters has been advancing with great strides.

In the future we will all have to do much more. Prevention of pollution in both surface and ground water supplies will be imperative; otherwise I doubt if we can ever get ahead, let alone catch up, with this nation's pollution problems.

To cope with the rising tide of pollution more research, technical and financial aid, and greater enforcement of water pollution control laws at local, State and Federal levels will be necessary. This all must be done now, before the irresponsible damages to our water resources become irreversible.

Some states have taken drastic action in providing financial assistance to industries and communities and some states have taken action in cooperating and working with a forthright program. I don't think there is any state second to Michigan in taking action in developing a program within its resources and giving the taxpayers a dollar's worth of work for every dollar they put in, because in my opinion, there is not a water pollution control program in any state of the union that is any better than you have in Michigan today and we hope we can keep that cooperative program going with you. God bless you. Thank you very much.

THE ROLE OF THE SCIENTIST

By
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The title of my presentation is "The Role of the Scientist" but I wish to point out that I shall not discuss the role of the federal scientist. As a matter of fact, I am delighted that Mr. Powers spoke before me, because he is an engineer-scientist who is held in high regard throughout the scientific community. He was in private industry, spent some time with the government and returned to industry. I'm a university professor who changed to the federal government - and we have had many federal employees who have gone to industry and universities.

The point is there should not be such titles as a federal scientist, a State scientist, an industrial scientist, or a scientist from a university. Presumably they all work with the same rule: To develop facts and information to be used by the public, by legislatures, and by administrators as a basis for making decisions. Unfortunately, scientists sometimes make decisions which are beyond their technical competence.

In talking about the scientist, I will speak in terms of the physical scientist, that is, the chemist, physicist, biological scientist, medical scientist and the social scientist, who has a very important role in water pollution control. Also I include the engineer in this category.

In the field of pollution control, the scientist has provided many answers which have resulted in water quality improvements. As discussed this morning, there are certain cases of pollution for which we have the technical answers. Pollution can often be identified without high powered analytical tools. Scientific analyses are not needed when the senses of smell and sight have been offended. We have developed many treatment methods for controlling pollution.

The research scientist provides new or improved answers to problems that need to be solved and for which we do not have an acceptable solution. There was also some discussion this morning concerning the relative roles of the scientist and the legal profession involved in enforcement. I'm not quite sure whether there should be a casting of "good guys" or "bad guys." When I first entered government some of my colleagues thought that the people in the scientific community were the "good guys" - they were the ones who were trying to be helpful. The enforcement guys were the "bad guys" - they're the ones who were forcing people to carry out a decision. There can be little doubt that the research scientist and the men in enforcement seek the same goal - to reduce control and abate pollution. And they do work together.

In the last few years I think that perhaps the scientist, with his improved analytical techniques, improved methods to relate impurities and pollutional effects, and new methods of treatment, is the one who is "putting the teeth" in enforcement.

The scientist deals with facts, but seldom with absolute values. I suggest that one principal area which should be better understood by those who are attempting to develop effective legislation and to enforce our pollution laws, is that scientists usually do not have absolute answers. This however does not detract from the significance and importance of the answers. The scientist deals with average values, ranges, probabilities, and with safety factors. This is part of the scientific process. We cannot easily define the complex relationships in the field of water resources and water quality control. The scientist is frequently required to make conclusions based on the best availabe information without carrying out additional work. Such a conclusion should be considered as the best interpretation of the data at a particular time - an interpretation which might change with the development of additional data. Certainly this is not a new concept but it appears that it is often forgotten.

When scientists and engineers disagree about physical facts, it can be attributed to any one of several possible causes. One is the lack of adequate data. Second, when the scientist begins deviating from scientific discourse toward political decisions, there can be some unwarranted extrapolation and distortion. Third is inaccurate reporting, whether deliberate or inadvertent. We must have reliable data and objective analysis as the basis for our discussions. If agreement cannot be reached on physical facts, the data and/or the interpreters may be inadequate and steps should be taken to correct the situation.

As scientists, we wish to cooperate with legislatures, with the public, and with all those concerned with water pollution control. I'm sure many of you have heard scientists say, if only the legislators would provide us with better laws and conversely legislators say, if only we had precise scientific data upon which we could establish criteria or standards.

What is the specific role of the scientist concerned with water pollution? First, the scientist has a key role in determining the relationship between impurity and water use. This consists of measuring the effects of a contaminant or impurity and of deriving scientific information to be used as a basis for establishing water requirements for all uses. A good scientist works to establish universally-acceptable scientific tests to measure cause-and-effect relationships. This is a very difficult task primarily because we do not have absolute factors; we are dealing with biological organisms from microbes to man. The effects may be physiological (acute or chronic), economic, or aesthetic.

Second, the scientist is involved in developing methods to measure the various impurities at a wide range of concentrations. This, again, is not a simple task. Some water pollution investigations during the last few years have required the measurement of concentrations of one part per billion or a few parts per trillion of pollutants. These quantities are so small that they are difficult to comprehend. We are developing tools, as mentioned this morning, which will enable us to determine these facts with the necessary accuracy and precision so that pollution may be controlled and laws enforced.

Third, the scientist is concerned with the fate of an impurity after it is introduced into the water environment. Waste from an industry, a municipality, an agricultural land drainage, or an impurity from a natural source follows a very complicated hydrologic path from its origin to the point of containment such as the ocean. The interaction of these pollutants with the aquatic environment, including aquatic life, is something which the scientist is trying to define in more precise terms.

Fourth, he is developing new and improved treatment methods so that any impurity can be controlled and reduced to any level.

The reduction of pollutant levels points to the difference between a scientific solution and an engineering solution. From a scientific point of view, we can remove as much of the impurities from any waste as we desire; this has been possible for many years and is an experiment performed by almost every high school student. We can distill water or double or triple distill it to remove impurities; this is a solution from the scientific point of view, but it is not necessarily a practical or engineering solution. In engineering, we must be concerned with the economics of removing impurities from wastes. Many new processes, in effect today, are no more than laboratory curiosities. Our efforts are to convert these curiosities to practical, economical, engineering realities.

Fifth, the scientist is interested in developing techniques to control pollution at the source. As Mr. Powers mentioned, the role of industrial managers is to watch the methods by which chemicals are produced and to modify production processes to reduce pollution. Pollution from agricultural lands may likewise be reduced by improved land management.

Finally, one area of research in which limited work has been done is in the socio-economic aspects of pollution control. In general, the social scientist is trying to develop methods by which we can equate various suggested solutions to a problem; with a problem such as water pollution, there are, generally, many possible solutions. The public is called upon frequently to make the decision, that is, to select the best among various alternates. In socio-economic research, we are trying to develop methods to make this choice easier.

I've heard it said that scientific research is carried out to permit polluters to continue the pollution of our streams. This cannot and will not be said of our national research program. The scientist should not be used as a person to justify continued pollution of our resources. He has a vital role in bringing about water pollution control. He provides more and better answers for water pollution abatement. He is developing better tools to assess and to demonstrate the effects of pollutants. Also, the scientist and engineer are modifying and improving techniques for treatment which were considered unfeasible or uneconomical but which now more communities and more industries can afford to install.

In summary, the role of the scientist can perhaps be outlined in four general categories.

First, the scientist establishes the relationship between impurities and the various water uses. This consists of determining the effect of an impurity on the water used for drinking, industry, agriculture, to propagate fish and other aquatic life, or recreation. These are scientific relationships that all scientists should agree upon within the accuracy of the work that can be carried out.

Second, the scientist has a role in developing suggested solutions to the water pollution problems and presenting as many practical solutions as possible. Reliable cost data should be presented with the solutions. To solve a problem, there are several alternates. In a particular situation, treatment, process modification, removing the waste from the water course, or providing additional dilution may be alternatives. All these solutions should be presented by the scientists.

Third, the scientist should develop techniques to facilitate a decision as to what is the best solution. In this role, the scientist has a very difficult task of translating scientific information so that it can be readily understood by the people who make the decisions through the political process.

Finally, the scientist develops the instrumentation to assure that decisions, once made, are carried out - to see that our laws are enforced. Once a decision is made as to what the quality of our waters will be and what the maximum levels of impurities will be in our streams, then the scientist can develop systems to assure the public that these standards are kept.

THE CHEMICAL INDUSTRY AND WATER POLLUTION LAW ENFORCEMENT

By
Thomas J. Powers
The Dow Chemical Company

We welcome this opportunity to represent the Chemical Industry at this unique conference. I say "unique" because enforcement conferences are quite common these days while conferences about enforcement are not. Those of us who must use public waters appreciate a chance to express a few thoughts on these matters.

Chemical companies operating in Michigan are well acquainted with enforcement. In our view the Michigan laws have been enforced, fairly and well. One company has been operating under restrictive orders for thirty years. Yet, the chemical industry has had a healthy growth in Michigan. Raw materials for the manufacture of many chemicals are plentiful in Michigan. Limestone, salt, natural brines, wood and water, coupled with access to sea going transportation, practically assure a continuing growth of our industry in this state.

The chemical industry operates in all 50 states. The value of chemicals manufactured is in excess of $30 billion. Michigan alone accounts for about $700 million with about 36,000 employees and payrolls of $250 million a year.

We believe we are an industry which is basic to the economy, basic to the production of food and fibre, basic to health.

We are a complex industry with 10,000 products.

We are a creative industry. This creativeness results in constant change. Change of product, change of process, change of wastes.

This constant change has caused the industry to become very alert to water pollution control. The need for alertness was recognized on March 17, 1936, when the Board of Directors of the Manufacturing Chemists Association authorized the formation of a "Committee on Prevention of Water Pollution." For years this committee operated as the Water Pollution Abatement Committee and is now called the Water Resources Committee.

The industry will sponsor a technical seminar at Ann Arbor the week of November 15. Some 25 representatives from chemical plants in the midwest will receive a full week of training in the why's and how's of water pollution control. The only purpose of these seminars is to enhance the industry's capabilities to meet its responsibilities in water pollution control.

Besides the seminar type of training the industry committee sponsors high level workshops in various parts of the country, for chemical companies both large and small. These workshops provide for an exchange of problem solving "know-how." They also provide for a free exchange of information, ideas and policies regarding legislation.

It must be evident that the chemical industry does have problems in the control of water pollution. The questions we have been asked were these:

First) What is the relation of water pollution law
enforcement to the operation of chemical
industry plants? and,

Second) What is the relation to the development of
the chemical industry?

The first thing the manager of a chemical plant does when faced with a demand for improved effluent is to review operations. His hope is that he can meet the demand by a process change. This process change may be the use of a more pure raw material. It may be the recovery of values. It may be the elimination of water contact. Rest assured, he will exhaustively study every method known to process engineering to solve the problem at its source. Failing in this, the chemical plant manager must search out the most economic treatment method. If the pollutants under study are not amenable to economic treatment he must find a different ultimate disposal method. The demand for better effluents then, has an immediate impact on the operation of a chemical plant. The impact is the diversion of manpower which immediately results in increased cost. Improved effluents can seldom be achieved in the chemical industry without increased costs.

One of the major problems of the chemical industry is the disposal of the salts of hydrochloric and sulfuric acids. The ammonia soda-ash process must be able to use surface waters for the sodium and calcium chloride by-product solutions which are inherent to the process. Here is a case where the only known economic answer is controlled disposal by dilution. It is either that or stop making the product. There are many processes in the industry which result in unwanted but necessary by-product salt production. Deep-well disposal may be a short time answer for small volumes, but ultimately we must face up to the fact that controlled disposal by dilution is the only method which will permit these processes to operate. It is for this reason that the chemical industry has and will show a great deal of interest in the establishment of water quality standards. We hope that such standards will be attainable under present and near future production capacities.

The demand for better effluents will effect chemical industry operations. It will require close attention to processing increased waste control facilities and improved effluent monitoring.

Now, how about the relationship of chemical industry development to water pollution law enforcement? The chemical industry expects that water pollution laws will be enforced. We expect that restrictions will become more specific as technical knowledge is increased. Expansion of existing plants may well be predicated on our ability to tailor our waste waters to the water quality criteria of the receiving water.

Sites for new production facilities are now carefully screened for ultimate disposal capacity. If we cannot manage our wastes to avoid a condition of water pollution at a particular site, we do not build there.

I have recently spent some time in Washington, and while I was there I learned about a verse in the book of Isaiah which says:

"Come now, and let us reason together." Those of you who are either Bible students or politicians will perhaps remember this verse. Maybe it is also a good one in the context of what we are discussing here.

It seems to me that what we must at all costs avoid is a pollution battle pitting the agencies of the state of Michigan against the industry of the state of Michigan. The keynote must be cooperation. We must be willing on both sides to sit down and reason out our problems together.

I must compliment the Michigan Water Resources Commission in this respect, because we have always found them firm but reasonable men. If you are willing to try to find a solution to your problem you can usually work out a satisfactory solution.

We in the chemical industry feel that cooperation is going to be mandatory between ourselves and the state agencies as we work to comply with the new demands of the state and nation, but we are confident that we can sit down, and as the Good Book says, "reason together."

The state agencies have on occasion aided in obtaining legislation which will enable industries to cope with their water problems. A good example in Michigan was the Surplus Water Bill - Public Act 20 of 1964.

The chemical industry must supply the chemical needs of the nation. The industry has grown at a much faster rate than the economy. We expect it to continue to grow. Where the industry locates its plants is decided by markets, transportation, and raw materials. One of the important raw materials is water, water for processing and water for dilution.

In summary, the chemical industry does not fear enforcement of water pollution laws. By working closely and cooperatively with the State Control Agencies we have been able to resolve many potential problems before the fact. As long as this cooperative attitude is maintained we have no fears. We have managed our wastes in the past and intend to manage our wastes in the future. Operating costs will increase and capital costs will increase. These costs can be minimized by proper site selection. In short, our people believe that we can have a healthy, robust, chemical industry and clean water.

THE RELATION OF WATER POLLUTION LAW ENFORCEMENT TO INDUSTRIAL OPERATION AND DEVELOPMENT

By
Ford T. Shepherd
Vice President, The Mead Corporation

I am glad to have the opportunity to participate in these discussions because the pulp and paper industry and Michigan are sizeable partners!

In Michigan out of 17 major industry groups the pulp and paper industry ranks the 9th largest in terms of payroll and employment. In 1962 the total payroll was $127 million for 27,000 persons employed. In terms of the value added the pulp and paper industry ranks the 8th largest. In 1962 the amount of the value added was $336 million.

In 1963 Michigan produced almost exactly 2 million tons of paper and paperboard, and 730,000 cords of pulpwood were used to produce almost 550,000 tons of wood pulp.

There are 55 cities in Michigan that have some kind of a paper mill or converting plant. Out of a total working force of 27,000 persons 10,800 are employed in the primary sector of the industry and 16,200 in the converting sector.

In discussing "The Relation of Water Pollution Law Enforcement to Industrial Operation and Development" I believe we should first recognize and evaluate the relationship between the Michigan Water Resources Commission and our industry.

I asked our people about this and here is what they told me:

> "The Michigan Water Resources Commission to date has been a very down to earth organization and has based its water quality criteria and demands on the individual circumstance. To my knowledge they have never asked for treatment for the sake of treatment alone. They have been most cooperative and patient with municipalities as well as industry but are not hesitant in referring a case to the Attorney General's Office for action."

And we are hopeful, of course, that the Commission is able to evaluate our cooperation and performance as satisfactory or possibly a little better than that.

Now with respect to stream pollution enforcement and new industry. Our judgment is that fair and equitable water quality requirements will not deter new industrial development. Conversely, new industrial development will be hindered if a state does not offer good water resources.

But what about stringent water quality requirements for the old mills that are polluters? This is the basic problem, of course, and it points up the necessity of the state taking a long hard look at its water resources policies.

Consider three examples:

(A) The small mill--small employment--small economic factor in the community--but large polluter. In this situation, it will be just too bad for the shareholders and the employees if this mill has to clean up all of its pollution. It may have no alternative but to shut down.

(B) Small mill--small employment, but a large economic factor in a small community. To be realistic the state must consider the closing of this mill in terms of costs of unemployment benefits, additional relief costs, and the economic loss to the community. Now this example brings us closer to a realistic appraisal of the cost of maintaining water quality and we begin to realize the importance of determining whether that cost is justified for improving the water quality of the particular stretch of river below the mill. The public benefits from the desired improvement should be estimated realistically.

(C) The large mill--large employer--extremely significant economic factor in its community. Here neither the state nor management can tolerate the closing of this mill. Realistically, the mill, through its employees and managers, has significant political voice. The question here is what compromise will be made between the profitable operation of the mill and clean streams--or put another way--is the cost of clean waters to be shared by the industry and the community (i.e., State) and, if so, in what proportions and how? Here again, the community has to decide what it is willing to pay for clean streams or how clean it wants its streams.

It is very clear that water pollution control standards, and enforcement add up often to very difficult decisions and nearly always to expensive solutions.

However, we have made a lot of progress to date and have a lot of experience to build on.

Over the past twenty-odd years, the National Council for Stream Improvement in the Pulp, Paper and Paperboard Industry has spent over $5 million for research in the treatment of pulp and paper mill wastes. Other groups and individual mills have spent additional millions on these problems.

That research has been put to use with gratifying results. The total organic waste load of the industry today is actually lower than it was twenty years ago, even though production has more than doubled during that period. The organic waste load from the average ton of paper has been reduced by 60% and water usage per ton has been decreased more than 50%.

Techniques have been developed and are now available to treat most of our industry's wastes. Color continues to be a real problem, however, but we have not given up. Future research activities will be devoted to developing more sophisticated and higher-degree treatment methods. More research attention is being given now to the treatment techniques devised for the purpose of reclaiming waste water so that it may be employed for a wider range of uses, both in the mill and generally, as for municipal purposes.

Pulp and paper industry expenditures for waste treatment facilities, as of the end of 1965, will total over $200,000,000. Eighty percent of the mills in the United States have waste treatment facilities of one type or another.

Capital expenditures for these facilities in 1965 alone will amount to $20,000,000. Maintenance and operating expenses are conservatively estimated at approximately $28,000,000, bringing total expenditures for 1965 close to $50,000,000.

Because of greater production, higher cost of materials, services and increased stringency of pollution control, waste treatment capital expenditures, plus annual operating costs, will double within the next decade. It has been estimated that an abatement program for our industry involving an 85 percent reduction in the BOD load and virtually complete removal of settleable solids would require an expenditure of $1 billion. If this were to be accomplished over the next ten years the annual expenditure would be $100 million.

If the pulp and paper industry were to spend $100 million per year on new waste pollution abatement facilities, this $100 million would be the equivalent of:

20% of the net profit of the primary pulp and paper industry, or

33% of the primary pulp and paper industry dividends.

In attempting to assess the impact of such large expenditures on the industry, it is necessary to consider the distinct difference between the construction of a new mill and the installation of abatement facilities at an existing mill.

In the case of the new mills, recent expenditures for waste treatment facilities have amounted to 2½ - 4 percent of total mill costs. The average cost, for example, of primary and secondary waste treatment at an unbleached kraft mill constructed today for $65 million is approximately $2 million, with annual cost of operation (including operating expense, maintenance and amortization) of $365,000.

The owners of such new mills carefully select sites where pollution abatement facilities can be installed at minimum cost. Increased efficiency in the new mills may then enable them to absorb such waste treatment plant costs and still remain competitive.

It has been the experience of the industry that most waste treatment control expenditures in an old mill do not provide a suitable return on the dollars invested.

The question, then, facing our industry's top executives is simply: "How can we, as community-minded citizens and as professional managers, solve the existing stream pollution problems of our older operations?"

Obviously, the solution of the industry's problems, is of considerable magnitude, not only from a technical standpoint, but also from a financial standpoint. Equally obvious is the fact that a job of this size cannot be done overnight.

We have learned from experience that a pollution abatement program, however vigorously pursued, is necessarily a long range undertaking. First, there is the investigation of available methods, the application of these to pilot plant studies, and the preparation of engineering plans and specifications. Secondly, there are the attendant problems of ordering, installing of equipment and the evaluation of results which is usually followed by modifications. All of this necessitates months and sometimes years of continuing effort.

To summarize, the remaining problems in our industry are:

1. The older mills -- many of which may already be marginal -- with their many built-in technical an engineering problems.
2. The $1 billion plus cost of pollution abatement equipment and facilities.
3. The time required to do an economically sound construction job of this magnitude.

The solution of these problems is essentially: an adequate sum of money plus a reasonable and practical time schedule.

This is not peculiar to our industry. Other industries, as well as municipalities, have the same problem. Governor Rockefeller testified before the Blatnick Committee on February 23, 1965, in behalf of his State of New York which has 75% of its streams classified after 15 years of effort; he said:

> "To meet the backlog of accumulated needs and new needs through 1970 will cost $1,709 million for local sewage treatment plants and interceptors. ... Elimination of industrial pollution will in-

volve another $67 million... This is a six year program."

Mayor Ivan Allen of Atlanta testified before the Muskie Committee field hearing on June 8, 1965. He too, reduced Atlanta's abatement problem to dollars and years. He said:

> "The overall inventory of capital improvement needs for sewer and water pollution control facilities, in the metropolitan system amounts to some 90 million dollars in capital investment and represents the major demand for all known useable capital improvement funds during the upcoming ten-year period."

Our industry's problems are not unlike the problems of the State of New York or the city of Atlanta. There is a difference, however, in the available solutions: New York's costs and Atlanta's costs will be borne by their taxpayers. Industry does not have such a source of income.

So what about the future?

Under the Federal Water Pollution Control Act, as amended by the Water Quality Act of 1965, Michigan continues to have the primary responsibility and right to prevent and control pollution in Michigan. Michigan can determine the water quality criteria applicable to interstate waters or portions thereof in the state. Michigan can develop a plan for the implementation and enforcement of its criteria. Michigan can determine the water quality standards for Michigan.

And what about the future for the pulp and paper industry?

First, the pulp and paper industry's philosophy, its performance and its accomplishments to date are pretty well known. The industry believes that it has been good corporate citizens and it is not about to turn into "bad" citizens in the communities where its operations are located.

Second, the industry has every reason to want to do what is right; it will do its very best to meet the practical requirements of the regulatory agencies.

Third, the complete correction of the industry's stream pollution problem, as indicated by the new standards provisions of the Water Quality Act of 1965, represents expenditures of serious proportions to the industry.

Unlike the usual capital investments made by the industry, these expenditures will not generate earnings. For the paper industry to absorb the full burden of this accelerated program would seriously limit its ability to make capital investments in new operating equipment and other facilities that, in turn, make for a profitable expanding economy and full employment.

Consequently, the industry as a matter of fairness and equity, will explore fully any and all financial means, including feasible programs of governmental financial assistance, by which the general public may carry a sizeable share of this greatly increased financial responsibility.

Fourth, the industry must, of necessity, urge the appropriate regulatory agencies--state, interstate and federal--to give full consideration of the industry's problem in the development of the standards and in the plans for their implementation and enforcement, to the end that the agencies' requirements for compliance will provide for attainable objectives and adequate time schedules to accomplish the objectives.

These remarks would not be complete without our thanks to Loring Oeming and his associates for their help, understanding and patience over the years. And we want to assure the Michigan Water Resources Commission of our desire to cooperate fully with its efforts in establishing Michigan's criteria, in developing the plan of implementation and in improving Michigan's water resources.

RELATION OF WATER POLLUTION LAW ENFORCEMENT TO INDUSTRIAL OPERATION AND DEVELOPMENT

By
John A. Moekle, Associate Counsel
Office of General Counsel
Ford Motor Company

I was very pleased to receive Mr. Olds' invitation to attend this conference and to state an industry viewpoint. Although each industry has its own peculiar problems, I suspect that all industry shares a common viewpoint on water pollution problems--namely the desire to cooperate closely with government to conserve and improve the quality of this most important of Michigan's resources.

As indicated by the program, I am an attorney employed by Ford Motor Company. Michigan is the home of the automotive industry and contains automotive plants of many different kinds. Ford was selected, I imagine, to represent the automotive industry not so much because it is typical, but because the scope of its Michigan operations is probably broader than that of any other manufacturer.

In Michigan, the automotive industry not only assembles automobiles, it manufactures, stores and distributes all kinds of parts and major components. The industry includes hundreds of suppliers engaged in supporting efforts. A catalogue of Ford - and all - automotive manufacturing would be about as follows, with some indication of the wastes produced:

The foundry business is certainly essential to our operations. Engine blocks and numerous parts are produced in the foundry process.

Wastes from this process are typically settleable solids - sand - and are collected and disposed of without affecting Michigan's waters.

The simple forging or stamping operation of the blacksmith was long ago replaced by hammers as tall as a four-story building and weighing more than 200,000 pounds. These presses, without which our industry cannot exist, fortunately are not waste producers, and again, do not affect our waters.

Engines are basic to automobiles and, in fact, it is sometimes suggested that the engine is the primary product of any automobile company, with the automobile simply being one application of the engine or power plant. Engines must be carefully machined, and high speed cutting tools require cooling fluids that must be used and ultimately discharged. Ford's answer to this problem has been the extensive use of disinfectants that permit the long-time use and reuse of soluble oil coolants with final removal and destruction of the oil when the coolant can no longer be used.

All of the machinery in a manufacturing operation must be lubricated to run. This means oil. After a certain length of usage, oil becomes dirty and there must be some disposal of it. Ford's answer to this problem has been one of good housekeeping - to collect it in scrap oil drums for sale to salvage operators and in some cases for treatment and later use as a fuel. When, in spite of all precautions, oil escapes, it is trapped at various sewer outlets by floating, pneumatic oil skimmers, and is removed from the water surface by traveling belt recovery units.

All industry - and the automotive industry certainly - has found that the American public likes glitter, and glitter is produced by plating. Plating processes require chromium and cyanide, and disposal of these useful chemicals poses very difficult problems. We have in the past employed dilution facilities and also destruction. New goals under consideration may require greater use of destruction techniques.

What I have considered to date is applicable to the whole automotive industry. My own company, however, is unique in Michigan because to a greater extent than the rest of the automotive industry it produces the steel that is the raw material for our products.

The steel making process requires ovens in which to make coke. Wastes produced from this process include phenols and cyanides. Under present orders of the Michigan Water Resources Commission, Ford disposes of the phenols to a deep well, where it is harmlessly dispersed. Cyanides are contained within the coke making process and are ultimately destroyed in the burning of coke oven gas.

The blast furnace is basic in the steel operation, converting iron ore, coke and limestone to pig iron. Its wastes are iron ore dust coming from the blast furnaces themselves. These dusts are recovered in giant thickeners and reused in the furnaces. With increased use of processed iron pellets from Ford's Upper Peninsula and Minnesota plants, it is expected that the volume of such dusts will be greatly reduced.

The open hearth furnaces which actually change the iron to steel have been replaced at Ford by the Basic Oxygen furnace. This high efficiency furnace, using forced oxygen, has no wastes that might cause water pollution problems, and is, of course, extremely effective in preventing air pollution.

At Ford we have rolling mills which take the steel in ingot form and produce sheet steel for our automobile bodies. These mills produce oil wastes which are recovered by huge gravity separators installed by Ford a number of years ago.

The sheet steel must be cleansed of scale by passing it through baths of sulphuric acid or "pickle liquor" as it is called in the steel industry. Ford has recently announced a major change in this process which, when implemented, will completely eliminate the loss of pickling liquor by use of other compounds.

Perhaps not so well known as our steel making operations is our glass manufacturing plant where glass is formed, ground and polished. The grinding and polishing operations produce as wastes, sand and polishing rouge. We have recently announced a major change in glass manufacturing at our Dearborn Glass Plant through the use of a float process. This program, in the actual construction stage at this time, will eliminate the loss of grinding sand and polishing rouge to the sewer system.

In brief, as most of you know, we have on the banks of the River Rouge in Dearborn, Michigan, perhaps the largest and most famous industrial complex in the world, named, interestingly enough, after one of Michigan's waters - the Rouge plant - so that everything mentioned above is produced on a giant scale. We at Ford never tire of quoting statistics about our Rouge Plant, and perhaps you would like to hear just one: We pump 400 million gallons of water a day from the Detroit River, through our Rouge installations and into the Rouge River. This, dramatically, I believe, shows our great interest in the waters of Michigan and in preserving their high quality.

Well, all activity begets problems, and problems, hopefully, beget solutions. You can imagine from what I have just outlined that in the course of the last twenty years, I have had more than one occasion to discuss our situation with the members of the Michigan Water Resources Commission and its staff. And I have had a long and, I believe - happy relationship with one of our prior speakers, Mr. Olds of the Attorney General's Office, who as we all know is probably our leading legal conservationist and protector of Michigan's waters. I say "discuss" advisedly, because I think it would be fair to say that the legal enforcement of water pollution regulations applicable to industry in the state of Michigan has not been a matter of combat or litigation, but a matter of reason and cooperation, a working out of problems through the mutual efforts of government and industry.

The tools for enforcement of water pollution regulations by the State are plain and at hand. They have been discussed by Mr. Olds in some detail.

Section 1 of the Water Resources Act creates a Commission consisting of the Director of Conservation, the Commissioner of Health, the Highway Commissioner, the Director of Agriculture, and three citizens representing industrial management, municipalities and conservation associations. We are glad to have an industry representative in the Commission; but have never had any feeling that the other members, in spite of their special interests, were in any way hostile to industry.

Section 2 states that the Commission shall meet at least once each month and shall keep a record of its proceedings. We at Ford study these monthly records with great interest. The Commission is required to protect and conserve the water resources of the State and controls pollution of surface and underground waters. Query - does it have an interest in the waters of our boat slip which are entirely privately owned? Probably so, but we think, not so great an interest as in the public waters beyond.

Section 3 authorizes the Commission to bring any appropriate action in the name of the people of the State of Michigan, either at law, or in chancery, to carry out the provisions of the pollution laws. The Attorney General may take charge of and prosecute criminal cases.

Section 4 authorizes the Commission or any agent to enter at all reasonable times upon public or private property to investigate alleged pollution, and Commission staff members have been occasional visitors to our Rouge installations over the years, both ashore and afloat. We await with some interest their first descent by helicopter.

Section 5 directs the Commission to establish pollution standards for waters of the state, significantly, "in relation to the public use to which they are or may be put." The same standards are not applied to all streams, and no one has ever envisioned that they should be.

Section 6 makes it unlawful to discharge, directly or indirectly, injurious substances to the waters of the state, and Sections 7, 8 and 9 spell out enforcement procedures.

Provision is made for appealing Commission orders to the law courts.

Any person requiring a new or substantial increase over and above present uses of water must file a statement with the Commission, and within 60 days the Commission must make an order stating minimum restrictions. If this order is not acceptable, a hearing may be demanded, followed by appeal to the courts if desired.

Any duly appointed agent of the Commission may make a criminal complaint against a person violating the Act, and substantial penalties may be imposed.

So much for procedure under the Michigan Act. As I have stated, we have had very little direct familiarity with the enforcement provisions of it, no objections to it, and are happy to maintain our matters on a discussion rather than a litigation or enforcement level.

The Federal Water Pollution Control Act is also applicable, of course, to many of our Michigan installations. It provides grants for research and development, and aid to governmental units - not industry - for construction of anti-pollution devices. The Federal Act is administered by a separate department within the Department of Health, Education and Welfare.

It provides enforcement measures against pollution of interstate or navigable waters, and, in brief, describes a notice and conference procedure, followed by hearing to determine if effective progress is being made in the abatement of alleged pollution. Our Company, and many others, in the Detroit River and western Lake Erie region has recently participated in a special conference to consider the quality of these waters and what can be done to improve them. We are now engaged in numerous meetings with state authorities to arrive at goals for this purpose.

As in the case of our direct dealings with the Michigan Water Resources Commission under the Michigan Act, we know of no reason why we cannot arrive at sound and practicable federal goals satisfactory to everyone concerned. As in the case of all industry of which I am aware, and it cannot be emphasized too strongly, we at Ford have constantly tightened our waste disposal methods over the years, particularly since World War II, to meet ever-strengthening standards, and continually higher water quality goals.

From an enforcement and industry standpoint, I would say that the most important provisions of any statute are the preliminary conference and hearing portions which permit industry and government to get together and discuss problems, and solutions to problems. We like very much to participate in the formation of new goals and standards. If they are clearly and fairly expressed, and are practicable, there will never be, I believe, any problem of enforcing them.

I should like to mention in conclusion two respects in which we believe government - both federal and state - might assist all industry in achieving constantly strengthening water quality goals:

By Act 250 of the Michigan Public Acts of 1965, if the State Health Commission finds that a facility is designed and operated primarily for the control, capture and removal of pollution from the air and is reasonably adequate for this purpose, the facility will be exempt from real and personal property taxes, and from sales and use taxes. The certificate of exemption may be withdrawn if the facility is no longer primarily used for pollution control and is being used for a different purpose.

I suggest that this exemption might well be extended to water pollution prevention equipment to encourage at least to a small extent, the expenditure of the large sums of money required to meet presently proposed goals by private industry whose essential function, of course, is to make the necessary profits to continue as a going concern.

Legislation with a parallel purpose has also been suggested in the federal field. In the last session of Congress, Senator Ribicoff, former Secretary of Health, Education and Welfare, and well known for his interest in the field of air and water pollution control, introduced a bill (S. 1670) under which taxpayers would be permitted to amortize over a comparatively short 36 month period certain costs incurred to abate water and air pollution. Rapid amortization would be dependent on certification by the Secretary of Health, Education and Welfare of compliance with minimum performance standards in furtherance of the Federal Water Pollution Control Act or the Clean Air Act as the case may be. Certification would also be required by the state water or air pollution control agency.

This bill was not enacted in the last session. If enacted, it would be helpful to industry in meeting the costs of water and air pollution prevention.

Again let me express my appreciation for this opportunity to address the conference. The automotive industry, engaged in a giant productive effort, also has found itself confronted with substantial problems of waste disposal. The resources and initiative of this great industry are fully available for the satisfactory solution of these problems, and I am confident that substantial progress will continue to be made.

SUMMARY REMARKS

By
Attorney General Frank J. Kelley

We are very gratified at the turn out here today and just to summarize briefly--we started this morning with Representative Snyder and Senator O'Brien who indicated that the Michigan legislature by the enactment of Senate Bill No. 69 has told Michigan municipalities and industry to stop polluting our state's water resources. They have also indicated that the legislature must now consider the ability of local municipalities to pay for pollution abatement facilities and that attention must be given to the problem of costs, especially with respect to Michigan's small villages and towns.

Mr. Louis C. Andrews, representing the Michigan Municipal League stated, "this conference will indeed be a 100% success if its results do go down the drain." Mr. Andrews reiterated the problems involved in financing and levying taxes at the local level of government. He stated that "we need help in building and operating needed treatment plants and sewer systems." Mr. Andrews outlined existing municipal ordinance control of water pollution and spoke of municipal relations with local industry regarding the use of municipal sewer systems for the disposal of industrial wastes. He has indicated to this conference that the direction in which Michigan municipalities are going today is to do whatever is necessary to take care of locally produced municipal and industrial wastes.

Mr. Joseph A. Parisi, representing Michigan township government, has stated that "the time has come when we all want to do something about water pollution in Michigan and in the nation." He has indicated to the conference that in our pollution abatement efforts 4 major things have to be kept in mind. First - we have to have enthusiasm; secondly, we have to benefit by and rectify past mistakes; thirdly - we must temper our desires with good judgment and finally - we have to be sure that what we are doing is absolutely right. In concluding, Mr. Parisi has indicated that Michigan townships want to do what is necessary to abate township water pollution problems. While townships are authorized to build abatement facilities, what is needed are additional statutes which will aid in township financing and enforcement of water pollution programs.

Mr. Chester C. Pierce, of the Wayne County Drain Commissioner's office, speaking from the standpoint of Michigan county government, discussed what Michigan county health departments can and are doing to abate water pollution. He also discussed a recent amendment of the State Water Resources Commission Act relative to bonding by townships to finance water pollution facilities. He has indicated that in his opinion Michigan townships under the present State Constitution can now issue court order bonds exceeding the 15-mill limitation. Mr. Pierce also discussed the County Department of Public Works Act and its application by Michigan counties to the problem of water pollution abatement. He further suggested to the conference that Michigan should initiate a financial program such as the one recently suggested in New York State. He concluded by saying that "the time to move ahead has come and we should move now to correct our pollution problems."

Mr. Murray Stein, representing the Federal government has this morning indicated that the federal authority in water pollution control has changed drastically in the past few decades. He has stated that water pollution activities are usually controversial and that water pollution control is an evolving legislative process mirroring public opinion. In the field of water pollution control this evolving process is taking quite a period of time because of the complexities involved and the end results hoped to be achieved are still not in sight. Mr. Stein further has indicated to us that the object of water pollution control is not to close industry or to stop community growth. Quite to the contrary, the challenge of water pollution control is to allow continued industrial and community growth and still maintain good water supplies for the legitimate uses which we are endeavoring to protect. He indicated this is what water pollution control is all about, and we must recognize that this is only one problem in our national life. He has told us that municipalities and industry are responsible for their own wastes and that it is not a question of not being able to afford pollution control, rather the real question is are we able to afford to do nothing about controlling water pollution. Mr. Stein has further indicated that, as we all know, Michigan's economy is closely tied to her water resources and he has indicated to the conference that Michigan, and other states, cannot afford NOT to effectively tackle the problem of water pollution control.

This afternoon Dr. Leon W. Weinberger, representing the role of the scientist in enforcement of water pollution control, pointed out that this is not the role of the government, state or industrial scientist but of all scientists working together to develop facts upon which decisions may be made by legislators and governmental authorities. Right now, Dr. Weinberger stated, we have scientific answers to clear up many of our pollution problems, but the role of the research scientist is to develop new methods for problems to which we have no answer. The scientist in water pollution control knows that he does not deal with absolutes, but rather, with averages, ranges, and probabilities. It is a matter of scientifically interpreting data. Dr. Weinberger said the scientist is a member of the water pollution control team whose key role is to determine:

1. The relationship between impurity and water uses (establishment of criteria or standards).
2. Measuring the concentration of impurities in water.
3. What happens when impurities are introduced into the water environment.
4. Striving for new treatment methods to combat water pollution.

Dr. Weinberger said that any amount of wastes can be removed but that does not mean that it would be an engineering reality or economically feasible.

Thomas J. Powers of the Dow Chemical Company, representing the chemical industry stated that in the industry's viewpoint Michigan's water pollution control laws have been energetically but fairly enforced. Mr. Powers also stated that the chemical industry is a basic yet very complex industry and is constantly on the alert to its pollutional problems. In the past the industry has sponsored seminars and workshops to train personnel to meet its various problems along this line. He said controlled disposal of wastes by dilution is the only method by which the chemical industry can dispose of its by-product wastes. Because of more specific, future governmental control the chemical industry expects to cooperate and reason out its problems to meet and comply with water pollution control requirements. Mr. Powers stated:

> "We believe we can have a healthy and robust chemical industry and clean waters."

Mr. Ford Shepherd of the Mead Corporation indicated that the paper industry and the State of Michigan are partners. He feels the Michigan Water Resources Commission has always realistically approached the pollution problem of the paper industry. In the industry's viewpoint the state must evaluate each individual situation in the light of the public well being.

Waste treatment and costs of the paper and pulp industry are expected to double in the next few years.

Mr. Shepherd states we must differentiate between old and new mills. New mills are located where they can more adequately cope with waste problems and still be competitive.

Mr. Shepherd concluded that the paper industry will continue to cooperate with the state and will explore all feasible economic means of meeting its pollutional problems.

Mr. John Moekle, representing the Michigan automotive industry, described the various operations of the Ford Motor Company and resulting wastes and the manner in which the problems are being solved.

Four hundred million gallons of water are being pumped daily for the Rouge Plant.

Without litigation the Ford Motor Company has worked amicably with the Michigan Water Resources Commission and is vitally interested in working toward the establishment of water quality criteria.

Mr. Moekle stated that both federal and state governments can assist industry in achieving better water quality by:

1. Granting tax exemptions on water pollution control equipment, and
2. Granting rapid amortization on pollution control facilities.

So it is our hope that the spirit that was expressed here today will continue. I can assure you from a government standpoint that cooperation between the various state agencies, primarily the Michigan Water Resources Commission, the Department of Conservation and our office will continue. We hope this is a first in a series of meetings and that we will have the benefit of each other's counsel in the future. Thank you all for coming, and we stand adjourned.

QUESTIONS AND ANSWERS - A.M.

Question: Mr. Chairman, I would like to direct this to Mr. Stein. What is the possibility of making our waste productive, such as fertilizers and by-products?

Mr. Stein: There is a possibility - I wouldn't count on it. This is a chimaera I have heard year after year and as I pointed out I have been in this business since 1948. You have to pay something for waste treatment. Occasionally a city or a plant will hit the jackpot and make it work. But this is like alchemy, if you expect it to be a generalized thing. We had a situation in Milwaukee. One of the reasons they could do that is they had a lot of brewery waste. When the breweries were on strike it didn't work. The Hiram Walker plant of Peoria has done it. Don't let a few freakish or outstanding examples change it. In some cases you can ameliorate the cost of waste treatment by recovery processes but don't expect that to make a profit.

Question: Mr. Chairman, I would like to direct a question to Mr. Stein. In reference to municipalities and industries, you used the statement "they must clean up their wastes." Then, I believe you defined it in stating that the effluent discharge from these entities should be traced and determination be made whether or not it was causing any damage. This would infer to me that there is a degree of cleanliness involved dependent upon the particular industry or municipality and where it is discharging its effluence. Is this so?

Mr. Stein: One, I was speaking just for the federal law on that when I talked about those procedures--federal enforcement procedures. Some state laws have provisions just banning discharge.* * *Now when you speak in terms of cleanliness, in dealing with the federal law, we have to show a damage to health and welfare. However, and I would like to make this abundantly clear, I recognize that we have to deal with the facts of life, and we have to assume that every stream has what is called in the trade, absorptive capacity. But I don't think we should utilize the stream in all cases to its maximum absorptive capacity and not leave any leaway. Once we do this we find ourselves in a position where we are almost on a treadmill. It is the Alice in Wonderland business. You're running, running, running and staying in the same place. You just clean it up. As soon as you get a population growth, expanded industry or a new industry, you pollute it all over again. I wonder why we should not take the same attitude as most of us do about our daily bath. Take it whether we need it or not. Or when we clean up a stream, that we don't take the attitude perhaps that some of the people do in other industries, such as road building, automotive or bridge building, and over construct just once -- just a little. If we did that we may have more leaway and we may be in better shape. I think that all this construction in an expanding economy is fine. We used to use the old 14th Street bridge to go across the Potomac about 50 years after they thought it was obsolete. It was still up because it was built so strongly, and I think if we did some of that kind of thinking in water pollution control, we might be in better shape.

Question: Mr. Stein, I understand after reading an article in an engineering magazine, there is a man in the water department in Washington who has available many, many methods of disposal of industrial and municipal wastes. Some of them are tried and some of them are not. Are you acquainted with any of these methods?

Mr. Stein: We're acquainted with all of them. As a matter of fact, Dr. Weinberger is here and we work very closely with his office. I don't want to disillusion you, but there is no magic way you can get rid of the "stuff." If there is anything that can possibly work and we can propose it, or put it forward, we're going to do it. We are faced with a very, very difficult problem and I agree with you completely that we have to take wastes out. We have explored and

and are exploring every possible method to do this. This is not an easy task. There is no device that is known to any agency of the federal government that we have not examined and explored thoroughly. Our scientists have not yet come up with any magic answer and as soon as we do, we'll tell Mr. Oeming about it, and if he hears about it first, maybe he will tell us.

Mr. Olds: The hour is drawing nigh for lunch and this afternoon we have the program which includes the role of the scientist and industry. We hope all of you will return. We are adjourned until 2:00 P.M.

QUESTIONS AND ANSWERS - P.M.

Mr. Karmann: My name is Joe Karmann. I now live at Ypsilanti, formerly of Dearborn, and I am affiliated with the Izaak Walton League of America, an organization representing the defense of soils, woods, waters and wildlife. My heart swells with pride to hear Mr. Moekle's report on the activities of the Ford Motor Company. I do feel, as the first mayor of that city and the one of two other terms of office in that capacity, that Mr. Moekle failed to mention the establishment of one of the finest sewerage disposal plants not only in Michigan but in the country, whereby the city did participate in its recommendations and construction in the first place. I think Mr. Moekle probably could have said a little bit about the scientific analysis of the solution, if you want to call it that, which passes through that disposal plant into the River Rouge and on its way to the Detroit river and the cities and towns below. I thank you for your kind attention and the opportunity to speak. Mr. Moekle, I congratulate you.

Mr. Moekle: We're delighted to give credit where credit is due and I certainly did not intend to omit the mention of any significant accomplishments. I'm glad you brought it up, sir.

Mr. McDermott: My name is Jim McDermott. I'm from the attorney general's office of the State of Wisconsin and I am directing my question to Mr. Shepherd. We have, as he is well aware, considerable paper industry in our state. I thought your statement was very interesting and I guess I interpreted it correctly that perhaps the paper industry would be willing to accept state or federal assistance in establishing the necessary sewage treatment facilities in connection with the industry. Do I take it, Mr. Shepherd, that at least the company for which you speak would be willing to accept the inevitable measure of federal or state control that would go with that financial assistance?

Mr. Shepherd: We knew, of course, that this statement would provoke some discussion. In the paper industry we have thought about it a great deal and have considered every angle. As you may know during the Korean situation there was a necessity certificate program. In other words, you got fast write off for building plants, etc. for the war effort. In the paper industry it was to get pulp capacity, and you could get a necessity certificate maybe for 40 to 60% of this project, and a great many plants were built. Now there has been no unanimity throughout our industry as to whether or not the fast write off was really an incentive. There is a great debate on this question right now. Two weeks ago in New York the Board of Directors of the American Paper Institute considered this question, and ---Well, I think I said it all in that "Now we will explore fully any and all financial means including feasible programs of governmental financial assistance."

Question: Mr. Shepherd, could I ask you just one more question in connection with this same item? Was there any discussion at the meeting you just mentioned of the legality of aid to private industry regarding the use of tax monies for a public or private purpose?

Mr. Shepherd: Well, I know there was a great deal of discussion. What the lawyers finally will determine, I don't know. I am sure that most of you have heard rumors that come January there is to be a stream pollution abatement program modeled along the idea and concept of the highway program of 1956. When I heard this about the first of August, I said "Boy, we're not talking about millions, we're talking about billions." The man who informed me of this said "That's right." Now, if you will think a little bit about the highway program. I was not a student of that legislation, but I read a good deal about it. As you know, this was a massive attack on the highway situation. It started out to build and a law was passed, to build 41,000 miles of road which would cost 41 billion dollars. Uncle Sam was going to pay on a 9-10 basis.

He was going to pay 37 billion and the states would pay 4 billion. This was on the interstate program. And then there was the ABC program to build the roads within the states and the federal government, and the states, I think, split this 50-50. Now in the first part, the interstate part, the federal government runs it. They dictate the size of the roads and all of the specifications and everything. Under the ABC program, the state determines it. To do this there was a trust fund established. The trust fund was to raise, I think it's right at 15 billion dollars and 15 billion dollars. Of course this is excise tax on highway users -- 4 cents a gallon on gasoline, I think, 10 cents per pound on rubber that goes into tires and tubes, so much on buses and trailers and trucks, and I think, come January, it starts on so much a gallon on oil and some other things. Now, if this is the program we are going to get in January and if industry has 50% of the pollution problem, as we are told, and if this is a massive attack to wipe out pollution, it would seem to me that this question is going to become academic as to whether or not Uncle Sam will pay some of industry's bill. If the federal government financed only the municipal stuff we would still have, quoting again, one-half of the problem left. So really, I don't know where we come out on all of this, but I think all of this has to do with the same basic question that you asked. Thank you, Mr. Chairman.

Mr. Roberts: Mr. Chairman, my name is John Roberts and I am from St. Clair Shores. I would like to commend the attorney general and the others who are responsible for this conference. I hope this is the very beginning of a strong concerted effort on the part of public officials, citizens and industry to get to work on this problem. I live in an area that some of us refer to as a catch basin of drainage from a county area down into one of our major lakes. We have had very serious problems over the years and there are two questions I would like to ask if I may. Number one is directed to Dr. Weinberger. I have heard references to a new system of dual filtration based on, I believe, using coal as a filtration medium. From the little bit I've heard, it seems to offer some very drastic innovations in this field. What are the immediate possibilities of this, and if it is a possible solution to some of our problems, are there any serious drawbacks to it?

Dr. Weinberger: I'm pretty sure the process to which you refer is under development by the office of coal research of The Department of the Interior. Office of coal research is interested in finding uses for coal. This process is one in which coal is sized and used as a filter, and after filtration, the treated waste passes through some additional coal where absorption takes place. This is still in the laboratory stage. From a point of view of performance, I might say there is no reason why this process should not work. Filtration of sewage is something that is rather well understood. Even the absorption properties of coal are well understood. This is at the stage, however, where there is virtually no -- well, there is not adequate economic data which would indicate to you what such a plant might cost or what it would cost to operate such a plant. Furthermore, the current status indicates that it is now going from the laboratory stage to the pilot plant stage. It will be another year or two before you get results from the pilot plant at which point the economics will be clearer.

Mr. Roberts: The main point in bringing this up is that there is so much controversy in the Wayne County Detroit area now concerning primary and secondary treatment based on the results of the U.S. Public Health Service study and survey which were released at the June conference at Rackham Memorial. I feel the director of the Detroit water supply system took a very righteous stand claiming that the Detroit system was far superior to anything else. Yet when the U.S. Public Health Service expressed its desire that the system provide both primary and secondary treatment, the first thing that was said was that it cost too much money, and we're back where we came from, that we don't want to spend the money. That's why I was trying to relate this new system to the present method of primary and secondary treatment to see if there is any possibility that it can ever be used in the near future to resolve this necessity of primary and secondary treatment.

Dr. Weinberger: As I have indicated, the engineering design of this particular process is certainly a year or two off.

Mr. Roberts: I see, thank you. The next question I would like to direct to anybody who can answer it. In the area where we live, two facilities have been constructed. One has been constructed, and one is under construction. Many people in our area feel this is only a part-time solution to a very serious problem. We talk about combined systems of storm and sanitary effluent control and at the present time we have two combination systems draining effluent into Lake St. Clair. A third system is going to be added. To alleviate this problem to some extent, retention basins have been built to temporarily withhold the flow in these systems during a one-year rainfall. If it rains more than one year, the excess is still dumped into the lake. If the one-year rainfall terminates at the end of that one-year fall, then what has gone into these retention chambers is pumped back into an interceptor and then goes into

Wayne County. I haven't seen any instances where these facilities have been built to any extent around the country. These two facilities are costing around 5 million dollars. True, they are helping to some extent. I would like to hear some comments from some of the experts as to whether the economics of spending 5 million dollars on two such basins which are not answering a problem, really jibe with our national efforts of trying to control municipalities dumping into our fresh waters. Is it economically feasible to spend 5 million dollars for these temporary -- I will refer to them loosely as tanks or retention basins -- when it appears there were methods and are methods available to prevent using these two drainage systems at all for sanitary flow?

Mr. Purdy: Well, Mr. Roberts, I'm not completely familiar with the system although the consulting engineers' reports have been to the effect that it is not economically feasible to go back into the system and completely separate them at the present time. As far as knowledge regarding other states that might be using this same approach, I believe New York has built several water retention basins at the present time. There was a recent article where Chicago is considering the storing of storm water flows in deep cavities under ground, producing power at the time of the storm but this is where we are using some of the tools and knowledge that we have on hand today to control an existing problem. Where we are not postponing a correction of the problem until we have an ultimate answer. This may not be the ultimate answer but it is at least a partial answer to the problem today and we are making use of the knowledge and information that we have.

Mr. Roberts: Well, your department has been most diligent in pursuing this problem. I'm well aware of all of your efforts and I've talked to you many times. I do know that you've issued decrees and orders to require communities to separate their systems. In some instances you have given them an option to separate or treat them in a combined system, and I was just concerned regarding this particular problem as it affects us. It aggrieves us because it infects our whole lake.

Mr. Purdy: In a new community it is possible to go back into the system and separate where in some instances, in a completely built-up community, the cost is much different.

Mr. Olds: I might just mention that recently the health department was involved in a law suit in the southern part of the state where they authorized building these retention areas. The downstream riparian didn't like the idea that these pools or ponds would be released in the fall and the heaped-up polluted water would go by his home. He went to court and an injunction was issued in his favor.

Mr. Wolin: Mr. Chairman, I am Arthur Wolin of Dearborn representing the Isaak Walton League. On the other side of the ledger I'd like to direct this question to Mr. Shepherd. We heard a lot about millions and billions it would cost to eliminate pollution and the possibility of closing mills. Well, do you know that beaches have been closed, rivers you might call closed, lakes that could be called closed, besides, the property values have decreased to a point where it is almost impossible to get rid of some of the cottages because of pollution. Now, can we place a value on that or a loss on that? That runs into terrific figures. I think that should also be considered. With all the knowledge and brains we have in this country, I think there can be a satisfactory solution to everybody. As a barefoot boy I can remember tramping all over the area where the Ford Motor Company is now located and fished all along the banks of the Rouge River. Think of the recreational values to the public if you could walk to that river, the Detroit river, or any place. The people would need no transportation, they could enjoy themselves. You can't place a price on a recreational or aesthetic value to the public. I think we should take whatever help we can get and do the best we can and eliminate this source.

Mr. Purdy: Well, I agree with you. I don't know what else to say, only that I agree with you.

Mr. Howe: I'm Frank Howe and I'm from St. Clair Shores. I'm interested in the gentleman's explanation of "economically unfeasible." I'd like to see some figures of comparison. This doesn't satisfy me. We spend one million one hundred thousand dollars for retention basin that works fine as long as it doesn't rain. When it rains, I see the evidence in my canal in my back yard, and it isn't enough for me to have just a simple statement from somebody to say it is economically unfeasible. We're polluting our own nest, we're polluting this lake, and we're polluting the Detroit river, and then we are bringing it in from the top of Belle Isle back to ourselves. This doesn't satisfy me at all. I'd like to know how unfeasible it is?

Mr. Olds: To whom are you directing your question?

Mr. Howe: The gentleman who said it was economically unfeasible. I'm only talking about terms of money. This is a temporary expedient, I think, a way to get somebody off the hook.

Mr. Purdy: I believe you probably live on the Milk River drain?

Mr. Howe: No sir. I live just north of the Martin drain.

Mr. Purdy: Well, the Martin drain retention basin just went into operation this past year.

Mr. Howe: I realize that and I still see the evidence in my canal when it rains good and hard.

Mr. Purdy: We are still in the learning process on this. I said the Milk River because this is the first one built in the state, very possibly the first one that was built in the country and . . .

Mr. Howe: I understand they'd used those gates once. Is that right?

Mr. Purdy: I can't tell you about the operation on this. It is under the supervision of the state health commissioner. Mr. Pierce is here, he can answer some of your questions much better than I. As far as the review of the consulting engineers' reports and the cost and so forth, this has been investigated. I can't quote you the figures. I don't believe this is the meeting to go into those figures but we would be most happy to explore this further with you at some other time. I don't have this information to answer you today.

Mr. Nichols: My name is Lester Nichols and I'm from the Michigan Department of Economic Expansion. I would like to direct my question to Dr. Weinberger. Do you feel that we will eventually be able to treat waste to the point that we can use waters for a broad range of uses or must we resign ourselves to the fact that some waters will have a priority of uses?

Dr. Weinberger: That's quite a question. May I take this opportunity to comment on the last question which I think is somewhat related to this. I think the gentleman makes a very important point and one which apparently I did not make very effectively in my presentation. One of the things that I suggested is that the scientists' role in this thing is to present various alternates with the cost for accomplishing them, so the public can make this decision. As was pointed out, and I think Mr. Shepherd's comments after mine pointed up that what we are talking about to a large extent is the amount that we are willing to pay--not we as scientists or we as enforcement people, but we as taxpayers. And I think in fairness to us individually, we ought to be presented with the various alternatives with the price tag for that particular solution. Now to answer your question. We are very close to having the technology which will enable us to take a waste water and to reuse this water virtually indefinitely. We are so close to this that in some parts of the country this is almost being done. In southern California, waste water -- and this is related to a question that was asked this morning -- did we foresee the time when sewage might be treated for a profit? This is a rather interesting question. I would have answered the question a little bit differently from Mr. Stein and point out that it is conceivable that the water portion of our waste water may be so important that the water we recover from waste treatment may make this whole thing economically sound. There are places in southern California where they are taking sewage, paying for it and then selling the treated water for other uses. So, in answer to your question, the answer is very definitely -- yes. We will have the technology that will enable us to take the waters, treat them and use them for any other purpose for which, again, we are willing to pay. I think this is as simple as I can reduce your question. That if we are willing to pay for this, we can accomplish what the gentleman from Ford and the others have all indicated. There is no difference of opinion here. Thank you.

Mr. Voigts: My name is D. L. Voigts and I represent the Packaging Corporation of America from Filer City. I would like to ask Dr. Weinberger my question.

What is being done in the so-called tertiary treatment of both municipal and industrial wastes in which we will be forestalling, or let us say, preventing a problem which unvariably will develop, and that is the nitrogen and phosphorous compound, the so-called nutrients, which are now being left in most treated waters. I am referring to secondary treated waters. I would like to know how much time is being spent on this research and is there a feasible solution to this?

Dr. Weinberger: The federal research budget in water pollution control research for this fiscal year is approximately five and half million dollars. This is the research money available to study all of the research needs in the field of pollution, ranging from the analytical problems, the cause and effect relationships, the various treatment, the epidemiology, the toxicology, etc. The matter of treatment for the removal of nitrates and phosphates is one which is receiving increasing attention from our research staff both in the house and through grant mechanism, which is another form of research support coming from the federal government. This grant supports many researches in universities. The problem of removal of the nitrogen and phosphorous is one which has only recently received the attention that many of us feel it should have received.

Methods are being explored to increase the effectiveness of biological treatment for removal of these nutrients, chemical methods for accomplishing this. Dr. Rollick of the University of Wisconsin has over the past years worked on an effective process for chemical removal of phosphates which is being used in a full scale plant in Lake Tahoe, California. There are other methods which we are exploring for the removal of these nutrients. These involve various processes including a number of those which have been developed by the office of saline water. So, in answer to the question, we are in the laboratory and as soon as this is successful, moving into the pilot plant, and then finally in the field evaluation stage. There are many major problems of water pollution needing research. We are trying to distribute our research effort to come up with the best balanced program. I might take this opportunity to put in a plug for one of the new laboratories which will be built in Ann Arbor. I think there is a point which has not been brought out at this meeting, and that is the interim between the time the public has been made aware and has become somewhat familiar with problems of water pollution, and the time that it takes to get a major program underway. In 1961, four years ago, congress authorized the construction of 7 new field laboratories to engage in technical assistance and research. These laboratories are currently still under construction. Four of them will be completed within the next 3 months. We will then begin putting the research effort in this problem of nutrient removal and all other problems. So, there is this time lag between recognizing the problem and coming up with answers. Incidentally, there are many more laboratories now beyond that original seven. One of these will be in Ann Arbor and at that laboratory we will be concentrating on the problems associated with the Great Lakes--nutrients being one of them.

Mr. Olds: Mr. Moekle would like to supplement his remarks.

Mr. Moekle: I simply thought that perhaps in this very serious conference there might be just a moment for a touch of sentiment. Mr. Stein said that he had been in this activity since 1948 and I have been in it since 1946. I beat Mr. Stein into it by two years and the great society by 18 years. And I've met a great many wonderful and very capable people during that period. We've heard a lot of talk about lay people and professional people this afternoon who represent a lot of different interests--chemists, medical doctors, public health personnel, lawyers, engineers and all the rest. All of us are lay people to a very great extent because very few of us encompass the entire field of water pollution. There is, however, one person in our midst who is a true professional. He is an engineer, he is a lawyer and a scientist. He knows a lot about public health and a great deal about legislation. When he left us the World Health Organization recognized his talents and has in the last few years sent him over a great deal of the world. He has been mentioned by name several times at this meeting and I thought he ought to stand up so that you could see the one true pro in our midst- Milt Adams.

Mr. Olds: Maybe it is appropriate at this time, Milt, that you say a few words. Tell us about some of the things you've seen in the rest of the world.

Mr. Adams: Well, it is a pleasure to be invited to this meeting today. I wouldn't expect it to be right unless everyone put his best foot forward and I think that is what is being done. As I was telling Larry Oeming, when Mr. Shepherd was stressing the problem of the small mill, I remember a little one down in the southeast corner of the state that protested before our Commission that if they were required to cut their fiber losses they would go out of business. They would close up. A few months later after this same plant had put in the facilities that our boys had recommended, they turned back to our staff and said, "Why the devil didn't you make us do this before--the money we've saved." So this is an ever growing problem. When I was in Caracas in July, the solė purpose of sewage disposal there was to reclaim out of the sewage of that great city enough useable water for industry and agriculture so that they could develop in that valley below Caracas. There was no mention about public health, nothing about fish life but it was water with which to exist. And, that is the challenge we face in many parts of our courtry as well as right here in the United States. It's nice to be with you.

Mr. Olds: Mr. Kelley would you please close the meeting with a short summary?

STATEMENT OF FRANK J. KELLEY

ATTORNEYS GENERAL CONFERENCE

"Chicago, Illinois, November 3, 1967. The four Attorneys General of the States bordering Lake Michigan met today in Chicago in a common effort to find an effective solution to the critical problem of water pollution.

"Attorneys General Frank J. Kelley of Michigan, Bronson LaFollette of Wisconsin, John J. Dillon of Indiana and William G. Clark of Illinois attended the conference.

"The Attorney General of each State is the chief legal officer of their individual State and as such has the ultimate responsibility of seeking legal sanctions against polluters.

"No single State can effectively solve this problem.

"Each Attorney General indicated increased liaison with the appropriate administrative agency within their own State.

"The Attorneys General will compile a list of polluters within their own States. The four Attorneys General will exchange this information and act as a clearing house for the information to insure that every source of pollution will be brought to the attention of the appropriate enforcement agency.

STATEMENT OF FRANK J. KELLEY

"The Attorneys General stated that they are exploring the possibility of all four States acting in concert as plaintiffs against major polluters.

"They indicated that the most effective solution would be through cooperation of the Attorneys General representing their States rather than to institute time-consuming, involved lawsuits between States.

"Further meetings will be held by all four Attorneys General in Indiana, Michigan and Wisconsin to deal with specific problems."

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Submarines and Man-in-the-Sea Project

Synoptic Survey and Instrumentation of Commercial Vessels

Testing of Marine Equipment

Education and Training

STATEMENT BEFORE THE CHICAGO FIELD HEARINGS BY PANELS ON BASIC SCIENCE AND ENVIRONMENTAL PROBLEMS, OF THE COMMISSION ON MARINE SCIENCE, ENGINEERING AND RESOURCES

by
David C. Chandler, Director
Great Lakes Research Division
University of Michigan, Ann Arbor, Michigan

"INTRODUCTION

"The St. Lawrence Great Lakes are a part of the 'marine environment' as defined by the Marine Resources and Engineering Act of 1966. My comments will be restricted to these lakes, emphasizing their role in promoting the national goals in Marine Sciences through the use of these waters in the conduct of programs in water quality and resource management, research and development, and education and training.

"UNIQUE CHARACTERISTICS
OF THE GREAT LAKES

"In order to appreciate the uniqueness of these lakes and their potential contributions to the National Oceanographic program, it is important to recognize their major physical characteristics.

"1. These lakes contain the largest single mass of freshwater on the earth's surface, and represent approximately 40 percent of the surface waters of continental United States. Furthermore, their combined areas of 95,170 square miles is about the same as that for each of the following seas: Persian Gulf, English Channel, Gulf of California, and the Irish Sea. Because of their size, they are frequently referred to as inland seas, laboratory sized oceans, and the midcontinental coastal area.

"2. The maximum lengths of these lakes range from 350 miles (Superior) to 193 miles (Ontario); maximum breadths range from 183 miles

(Huron) to 53 miles (Ontario); maximum depths range from 1,333 feet (Superior) to 210 feet (Erie), and the mean depths range from 487 feet (Superior) to 58 feet (Erie).

"3. Ratio of drainage area to water surface area = 3:1.

"4. Total shoreline = 9,600 miles.

"5. These lakes possess both lacustrine and oceanic characteristics.

"a. Lacustrine

(1) Inlet - Outlet - flow through

(2) Low salinity - less than 300 ppm

(3) Predominantly freshwater biota

(4) Seiche effect greater than tidal

(5) Land locked (definite boundaries)

(6) Covered by a single weather system at a given time

"b. Oceanic

(1) Visible effects of Coriolis force

(2) Distribution of upwelling

and sinking according to relationship of current streamlines and the shore

(3) Presence of distinct water masses

(4) Modifying effects on weather

(5) Thermal cycle with one period of overturn

"PRESSING PROBLEMS OF POLLUTION ABATEMENT AND WATER RESOURCE MANAGEMENT

"The Great Lakes represent a tremendous natural resource of increasing importance to both the United States and Canada. Presently these multi-use waters are being used for 1) navigation, 2), hydroelectric power, 3) domestic and industrial water supply, 4) irrigation, 5) domestic and industrial waste disposal, 6) recreation, 7) food supply and 8) scientific research and the training of marine scientists. Present indications are that multiple use of these waters will be short-lived if they continue to be used as receptors of domestic and industrial wastes produced in the drainage basin. Pollution is, therefore, a pressing problem in these lakes jeopardizing all uses and producing a general deterioration of the human environment.

"Attempts at pollution control in the Great Lakes have been piecemeal, each political unit trying to solve its problems on a local basis without consideration of the lakes as a total system. Lakeshore communities proceed on the assumption that the lakes are an unlimited mass of water with the ability to assimilate unlimited quantities of waste in any form. Inland communities use rivers entering the Great Lakes to transport their wastes downstream without realizing that the lakes become the eventual receptors. Unfortunately less is known about waste assimilation in lakes than streams, but it is generally agreed that the residence time for pollutants in lakes is greater and much of the particulate matter settles to the bottom, causing a filling in of the basin. The residual effects of pollutants incorporated in bottom sediments are not known but generally believed to be significant. These facts support the belief that the Great Lakes environment is dangerously susceptible to pollution because most avenues of waste disposal in the drainage basin terminate in these lakes.

"Physically, the St. Lawrence Great Lakes drainage basin in one system, however, politically it exhibits a pattern of fragmentation. This physiographic unit is shared by nine States in the United States and two Provinces in Canada. The heads of these political units can speak only for their unit. There is no unified plan or approach for the management, utilization, or the solution of common problems in this drainage basin. Within the United States are seven or more Federal agencies charged with Great Lakes missions: 1) Federal Water Pollution Control Administration, 2) U. S. Bureau of Commercial Fisheries, 3) U. S. Coast Guard, 4) U. S. Corps of Engineers and the Lake Survey Office, 5) U. S. Geological Survey, 6) U. S. Weather Bureau and 7) the U. S. Public Health Service. Each agency has carried out its mission in a commendable way, but none is concerned with the lakes as a complete system. Superimposed on this are the efforts by each Great Lakes State to deal with these waters within the framework of its individual interests. Only the International Joint Commission attempts to represent the international interests of the United States and Canada, and it, too, has a commendable record of accomplishment within the framework of its objectives, which were defined in 1909. More recently, 1967, the Great Lakes Basin Commission has been established to coordinate the United States activities on the Great Lakes. This is a mechanism which offers promise for bringing about coordinated regional planning and management. Basically, there exists the mechanisms, the technical and scientific knowledge, manpower and economic need for unified programs in pollution abatement, water resources management, and regional planning of the Great Lakes drainage basin. The fact that these programs are non-operative is of deep concern because decisions are made and priorities established in the absence of a unified or regional plan or an understanding of the Great Lakes as a total system.

"ROLE OF GREAT LAKES IN PROMOTING NATIONAL GOALS IN MARINE SCIENCES

"Limnologists and oceanographers employ

different scales of study in their attempt to understand the physical, chemical and biological processes in water bodies and the interactions between these waters and their atmospheric and geological boundaries. In the size series of water bodies from small lakes to oceans, the Great Lakes represent the mesoscale Aquatic System. These Great Lakes are subject to essentially the same physical, chemical, biological, meteorological and geological regimes as the oceans, but in addition, they possess definite boundaries and each lake generally has a single weather system over it at a given time. Furthermore, the Great Lakes drainage basin is a discrete physiographic unit, within which exist integrated social, political and economic regimes directly dependent upon these lakes.

"By virtue of their size, location and general characteristics the St. Lawrence Great Lakes are uniquely suited for programs in: 1) basic research, 2) model studies, 3) engineering and development, 4) testing of marine equipment and 5) education and training.

STATEMENT OF FRANK J. KELLEY

"Basic Research.

"Mesoscale aquatic systems are represented by more than 100 water bodies with surface areas between 5,000 and 30,000 square miles. These are intermediate in size and general characteristics to small lakes and oceans, and some possess both lacustrine and oceanic characteristics. Little is known about the environmental conditions of these mesoscale waters, yet in volume they represent 60-70 percent of the surface freshwaters of the world. If these resources are to be effectively and efficiently managed for the maximum benefit to man, their environmental characteristics and processes must be understood sufficiently to predict the planned and unplanned effects of man upon these waters. The St. Lawrence Great Lakes exhibit a wide spectrum of characteristics in respect to morphometry, orientation of long axis to prevailing winds, climate, geological formation in drainage basin, land use of drainage basin, urbanization and eutrophication.

"In addition to the usual opportunities for research on aquatic processes and phenomena

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(ecosystem and population dynamics, nutrient cycling, environmental requirements of organisms, exchanges between water and its atmospheric and geologic boundaries, etc.) the Great Lakes afford unusual opportunities in certain areas as illustrated by the following selected examples:

"Physical Nature of Currents. Water currents in the Great Lakes contain both geostrophic and wind-driven components, as do those of the oceans, but are free of the tidal components that complicate such studies in the ocean.

"Studies of the relationships between the geostrophic and wind stresses as current-producing mechanisms are possible only in the mesoscale offered by the Great Lakes. The relation between the wind and thermal forces go through a seasonal progression from winter through spring, summer, and fall. This 'laboratory experiment, where the input parameters are systematically changed, is repeated annually, and provides the necessary information for creating and testing of theoretical models.

"Water Masses. The origin, characteristics and fate of water masses can be studied under mesoscale conditions. These masses lend themselves to studies of lake circulation, and of phyto-zooplankton development and interrelationships. The growth, reproduction and seasonal abundance varies for a given plankton species in different water masses.

"Ice Cover. The formation, structure, extent, breakups and energy relations of the ice cover varies with each lake, because of differences in latitude, lake morphometry and orientation to prevailing winds. Records of ice may be obtained from shore stations, plane or satellites. The relation of ice to lake navigation adds an applied aspect to an otherwise theoretical problem.

"Land Drainage and Water Quality. Rivers entering the lakes are relatively small, but their basins are large enough to encompass a variety of land-use practices, and/or community developments. Also, the lakes are large enough to receive this river discharge without the entire lake being affected. Therefore, the impact of each river system on Great Lakes water quality can be determined.

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"Eutrophication. The nature and rate of natural and artificial eutrophication can be studied effectively in the Great Lakes since each lake is distinctive in respect to geochemical conditions, degree of urbanization and industrialization in its drainage basin. There is a wide spectrum of eutrophication conditions, from advanced stages in Lake Erie to a minimum in Lake Superior. Furthermore, the flow-through characteristics of the lakes make it possible to follow downstream effects of each lake on water quality.

"Fish Population Studies. Records of commercial fish catches of the Great Lakes are continuous and complete since 1867. These records make possible unusual studies in population dynamics and in population and species response to environmental changes, invasion of marine species and fishing pressure.

Invasion of Marine Species. Marine species are entering the Great Lakes and some have become firmly established 1,000 miles from the sea. Examples include the sea lamprey, Petromyzon marinus; alewife, Alosa psuedo-harengus;

smelt, Osmerus mordax; a polycheate, Manayunkia erienensia; and a copepod, Eurytemora affinis. Studies of such species will contribute pertinent information on rates and mechanisms of adaptation of marine organisms to fresh water.

"Model Studies.

"The Great Lakes represent a mesoscale aquatic system well suited for model studies of processes and problems of regional and global importance. Two selected examples will serve to illustrate this concept.

"Regional Environmental Studies. The St. Lawrence-Great Lakes region provides the essential ingredients for a model study relating to the enchancement of the human environment. It is a physiographic unit dominated by the largest single mass of freshwater on the earth's surface and is in the path of the most rapid industrial and urban development in the United States and Canada. This situation offers an interesting study of the interrelationships and interactions of the social, political and economic aspects of the region along with a study of the scientific management and utilization of its tremendous freshwater resource.

"These lakes also lend themselves uniquely as a model for studies in international resource management, since they represent a hugh natural resource of great economic importance to both the United States and Canada. Probably no two other countries share a resource of this magnitude, that possess so much technical knowledge and have as a long record of friendly cooperation.

"This concept is presently being pursued by a Conference Group composed of representatives of the Committee on Institutional Cooperation (Big Ten Universities and Chicago) with the aim of determining the feasibility of a systems model of the Great Lakes Region. The first step in their efforts have been toward constructing water quality and water quantity models.

"Interactions between Water and Air. Lake Michigan, for example, subserves a unique laboratory function in the study of weather modifications by water. Situated transverse to movement of air masses and weather from west to east, this lake is large enough to produce clean-cut modifying effects upon weather crossing it, yet is not so large that separate weather systems are likely to exist over it at the same time. Its landlocked nature allows Lake Michigan to be surrounded by weather stations, a condition that allows the observations of air-mass parameters before and after modification by the underlying water body, a situation which cannot be satisfactorily achieved for oceans.

"Furthermore, studies of wind-to-wave relations may be made under simplified conditions, because of the absence of wave-trains or swells from other distant weather systems. Open-water fetches of 50 to 300 miles are common on the Great Lakes and these distances can be measured accurately.

"Engineering and Development.

"Surface Vessels. The conduct of research on the Great Lakes requires equipment, instruments and procedures very similar to those needed for oceanographic studies. Nevertheless essential differences do exist between these two environments in regard to, e.g., distances, sea state, and number of accessible ports. Most oceanographic cruises are from a few weeks to several months in length, while on the Great Lakes cruises are from one to several days. In these differences lie opportunities for exploring new concepts of the construction and operation of research vessels. Conceivably, a multiple purpose vessel could be constructed for research, support for submersibles and diving equipment and for student training. Also, the Great Lakes afford a good place for testing the applicability of hydrofoils and various kinds of aircraft for a rapid coverage of lake surface conditions.

"Submarines and Man-in-the-Sea Project. Water of 600 feet or greater depth is accessible in several parts of the Great Lakes within a distance of 30 miles or less from shore. Numerous deep-water ports exist on all the lakes, and within the immediate region are work and research ships, diversified industry, supply and engineering companies and the intellectual and technical resources of numerous universities. In no other place in the world does this combination of conditions and facilities exist within so small an area. These conditions are highly favorable for the development and testing of research submarines and various aspects of the 'Man-in-the-Sea' project. The economy of time and money is evident.

"Synoptic Surveys and Instrumentation of Commercial Vessels. It is feasible to make a single-day multiple-ship survey of an entire lake, since ports are numerous, the maximum width is less than 185 miles and numerous small surface vessels are available for charter. Synoptic areal coverage of a single lake can be achieved in 12 hours, and surface ship support is readily available for calibration points.

"Furthermore, application of the concept of 'Ships of Opportunity' or 'Neptune Projects' to commercial vessels in the Great Lakes has some promising possibilities. One hundred or more vessels such as freighters, ferries and fishing vessels may be on the lakes on any given day during the navigation season. Most of them operate on a scheduled course.

With proper instrumentation, a synoptic coverage of any one lake, or possibly of all the lakes, could be made on a daily basis. In addition to giving lake-wide coverage (an impossibility with research vessels for economic reasons) this would be a means of collecting valuable routine survey data, while freeing research vessels for specialized duties. Existing technology makes possible the collection of various kinds of physical, chemical and biological data from ships under way at speeds up to 18 knots.

"Testing of Marine Equipment. The freshwater environment in the Great Lakes provides depths equivalent to those of the Continental Slope, at distances less than 30 miles from commercial ports with ship-support facilities, in water relatively free of corrosion and biological fouling. Because of these conditions the development and testing of marine equipment such as: 1) automatic buoy systems, 2) fixed platforms, 3) diving equipment, 4) research submarines, 5) acoustic and electromagnetic probes, 6) chemical probes, etc. can be carried on easily and economically.

STATEMENT OF FRANK J. KELLEY

"**Education and Training**.

"In the fields of limnology and oceanography, the basic problems, methods and procedures, and much of the equipment are identical, and in many instances a person trained in one becomes professionally employed in the other. Since the Great Lakes are intermediate in the total size-series of the world's water bodies, and possess both lacustrine and oceanic characteristics, they are uniquely suited for the education and training of aquatic scientists. The overlap of several disciplines in Great Lakes studies provides a natural common ground and needed meeting place for limnology and oceanography that can and should be utilized to the benefit of both.

"Within the Great Lakes region are at least 20 universities with established programs in the aquatic sciences involving curricula, scientific personnel, and a great diversity of teaching and research facilities. Research vessels suitable for training purposes are operated by universities in the region. In addition to giving students shipboard experience with oceanographic equipment and procedures, this arrangement has the unique feature of dealing with a complete aquatic system in an interdisciplinary manner. Such an approach is not possible on either small lakes or oceans.

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"MONITORING OF GREAT LAKES WATERS

"Monitoring of the waters of the Great Lakes is important relative to 1) identifying sources and kinds of pollution and 2) identifying long-range changes in the quality of water both from natural and manmade processes. At present there is not a satisfactory monitoring system to achieve either of these goals.

"Monitoring must be considered in a conceptual model and also relative to technological methods of monitoring. A conceptual model must be system oriented with respect to variables measured in time and space. The results of the conceptual model dictate the development of proper technology and the proper use of resultant monitoring instruments relative to time and position.

"Monitoring Model.

STATEMENT OF FRANK J. KELLEY

"We propose a dual program to develop an effective monitoring system for the Great Lakes. The first program would be a total evaluation of water quality data for the Great Lakes (and especially for Lake Michigan). This analysis would involve 1) identification of factors of water quality, 2) identification of gradients of water quality factors, 3) identification of time trends, and 4) prediction of optimum sampling locations and times. Water quality factors will be isolated using factor analysis techniques on existing station data. Results of this study will show the degree of dependence (or independence) of commonly measured variables upon variables commonly accepted as indicative of water quality (BOD, DO, color, etc.). The total results would also allow prediction of better criteria for water quality by showing relationships to indicators used presently. In this way, the minimum number (and kind) of variables required to define water quality will be determined.

"Due to population and industrial density as well as environmental and natural processes (currents, nature of the bottom sediment, etc.), a measured quantity will vary at a different rate in different regions of the lake. The amount of change horizontally and vertically and predictability of change (lack of noise) will define optimum sampling spacing. Trend surface analysis is a statistical tool which allows the determination of optimum spacing by fitting of up to a third order polynomial three dimensional curve and also allows the plotting of difference maps. Difference maps represent the difference between actual results and that of the function. Low gradient maps require only a few sampling stations whereas maps with high gradients and large difference demand closer sampling intervals. Areas of high 'noise' (large differences) suggest 'unknown' (unmeasured) variables or factors.

"Spectrum analysis allows the determination of cycles (seasonal, etc.) in data. Chicago, Milwaukee, and Cleveland water stations have data that can be examined as a function of time. Analysis of these data could not only determine the period(s) of cycles but also point out seasonal periods of high noise when sampling should be emphasized.

"Prediction of optimum sampling times and locations depend upon results of the three above studies as well as testing of predictions. This would allow the optimizing of monitoring stations and in many cases allow advance indication of deterioration of water. In this line, it has not been recognized that many conditions of deterioration of water inshore can be identified offshore before the condition develops. Therefore maximum returns from data analyzed in a manner outlined above is required to efficiently monitor a lake.

"The procedural aspects of this study are 1) obtain GLIRB, UM and water intake data, etc., 2) develop computer programs, 3) define conclusions from the statistical analysis, 4) using random times and locations, test the predictability of the model by sampling, 5) redefine monitoring conclusions from the tests, 6) define technological monitoring network required.

"Technical Monitoring Devices.

STATEMENT OF FRANK J. KELLEY

"The output of the above study will be input in the sense of the monitoring devices required for Great Lakes study. At present, commercial devices (Beckman, Fairchild, Honeywell) monitor conductivity (TDS), pH, DO, temperature, residual, chlorine, and some other specific ions such as F, Br, Ca, and Mg. Besides definitions of variables that should be monitored (output from above study), we recognize the following as desirable: nitrogen, phosphorus, total crop, dissolved organic compounds, and light transmission (turbidity, etc.). All of these variables require basic research and applied research particularly with respect to the sensing elements. Solid state electrodes may be feasible for phosphorus and nitrogen, a filter-opacity and/or reflectance device for crop, and a UV spectrum analyzer for dissolved organic substances. All should be connected to a data analyzer (computer) and be usable from shore, ship, and remote installations. Besides this developmental work, there is reliability testing that needs to be done on existing probes. For example, the membrane oxygen electrode fouls in high particle and high H_2S water. It does not respond well under high pressure (great depth). There is a high probability that a doped crystal similar to the Orion fluoride electrode is usable for oxygen measurements.

"No one has yet married a computer to sensing devices although this seems desirable relative to display of data on a network (lake wide) basis and to display analysis rapidly for remedial purposes.

"Procedures: 1) obtain one available commercial unit for reliability testing and modification; 2) basic research into the use of solid state electrodes for sensing elements for nutrients and oxygen; 3) electronic development for other sensors amplification and analysis of signal; 4) feasibility of small scale computer use in larger network system; 5) testing of components; 6) write specifications for network system.

"Personnel involved: J. R. Kramer, H. K. Soo, Floyd Elder, Vincent Noble, Eugene Stoermer, John Ayers, Edward Callender.

"Estimated cost: $150,000 per year over five years, or $300,000 per year over three years.

STATEMENT OF FRANK J. KELLEY

"**Nutrient Chemistry Study**.

"The criteria used for defining water quality (and hence sources of pollution) are not well defined except in extreme cases. Factors that appear to be important are excess nutrients (particularly phosphorus), high oxygen demand liquids and solids, turbidity, soluble organic compounds, and temperature. But neither the quantitative level or long term changes relative to 'assimilative' powers of the lakes are known. These must be ascertained in order to define water quality criteria for an efficient management program.

"We conceive of inducing levels of pollution in situ in plastic bags and monitoring the change in the water with emphasis on biology. Besides changing the composition of the water by adding at high concentrations nutrients and other chemicals, we shall run studies on systems with and without bottom sediment (and different kinds of bottom sediment), open or closed to the atmosphere, with onshore and offshore water and biota, and as a function of temperature and turbidity. The definition of kinds of input would come from cases of presently known pollution as well as from trends already observable in the lakes. In addition, other presumed future sources of pollution would be considered. In this way, one can ascertain specific changes in all kinds of waters if certain conditions are allowed to continue. Once a severe condition of pollution is developed in the 'bag,' various techniques would be used to attempt to return the water to high quality. This procedure is different from similar laboratory studies in that natural fluctuations relative to temperature, sunlight, turbidity, and particulate matter would be incorporated in the system. All laboratory studies have not included one or more of these conditions.

"Personnel: J. R. Kramer, Edward Callender, Eugene Stoermer, Floyd Elder.

"Estimated cost: $80,000 per year for three years.

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STATEMENT OF FRANK J. KELLEY

MICHIGAN STATE UNIVERSITY, East Lansing
OFFICE OF VICE PRESIDENT FOR RESEARCH DEVELOPMENT
SCHOOL FOR ADVANCED GRADUATE STUDIES
OFFICE OF THE DEAN

24 January 1968

Mr. Frank J. Kelley
Attorney General
State of Michigan
Lansing, Michigan 48933

Dear Mr. Kelley:

This replies to your letter to President John A. Hannah, 24 November 1967, concerning research on the problem of pollution of Lake Michigan. May I take this opportunity to indicate in a broad manner the state of research and to suggest that contact on specific questions and matters be directed to Dr. R. C. Ball, Director of our Institute of Water Research.

The research by the universities on Lake Michigan has been carried out with two rather distinct approaches. The University of Michigan, with its large ship facilities, has carried out certain studies on the physical parameters of the lake. Data on these investigations have been published by the Great Lakes Institute and copies of these reports and any data collected since the most recent report can be obtained by contacting Dr.

STATEMENT OF FRANK J. KELLEY

David Chandler, Director of the Great Lakes Institute of the University of Michigan.

The Michigan State University scientists have followed the premise that undesirable conditions now being found in Lake Michigan are to a large extent a product of the pollution and nutrients brought to the lake by the stream systems. It is in this area of pollution ecology that we have concentrated our efforts.

The results of the research projects in water resources at Michigan State University are available in theses forms and as published information and cover an extremely wide range of subject matter. These have been made available to the Michigan Department of Conservation and its Water Resources Commission for possible incorporation into their management and surveillance programs. Examples of the research are found in studies of the methods of removing nutrients from sewage plant effluent discharges to prevent the entrance of these nutrients into streams and thus eventually into the Great Lakes, where they contribute greatly to the processes of eutrophication. Studies are underway concerning the kinds and types of pesticides which move from our farm lands, our urban developments, and our sewage disposal plants to eventually find their way into Lake Michigan. Here they may move through the food chain of the salmon, where they may affect the reproductive potential of the adult fish.

Cooperative projects are now actively underway to quantify the amount and nature of materials that constitute the major pollutants which enter Lake Michigan from the State of Michigan. Presently this information is now available in the detail necessary for proper evaluation of the problems involved. We are undertaking this evaluation in considerable detail on the major contributing watershed, the Grand River. Following the physical, chemical, and biological treatment of the samples, the resulting data, along with cognate data concerning source, etc., will be fed to a computer-based storage and retrieval system. It will thus become readily available for answers to requests such as yours.

A large-scale demonstration project is in an advanced stage of planning on our campus. This will put into operation the salient facets of our past research findings to evaluate methods of removing the entire nutrient-rich effluent of a disposal plant from the receiving stream. This or comparable types of waste handling may become essential to all communities of the State to prevent our wastes from reaching and adversely affecting the Great Lakes.

It would be extremely difficult, if not impossible, to detail each of the research projects which have been undertaken on the Michigan State University campus over the past years as they relate to water quality and thus directly or indirectly to Lake Michigan. The material on all such research projects is being gathered together in one area under the sponsorship of the Institute of Water Research. As indicated above, Dr. Robert C. Ball, a member of our staff and Director of the Institute, would be very happy to supply you with any specific information concerning the water quality and water resources problems of Lake Michigan at any time that you might wish.

We will be pleased to offer our services and cooperation in your efforts to abate the pollution in Lake Michigan. (Signed) Milton E. Muelder - - - Vice President and Dean

STATEMENT OF FRANK J. KELLEY

Letter to Governor George Romney
From Attorney General Kelley
January 16, 1968

"Dear Governor Romney:

"During the summer of 1967 a huge die-off of alewives caused the beaches of Lake Michigan to be littered with dead fish, posing a menace to health, clogging water intakes, and causing a loss of tourist trade in the four Lake Michigan States estimated at over $100 million. Our State suffered the most. The impact was devastating. The estimated loss of tourist trade in Michigan alone was $55 million during 1967.

"Indications are that in 1968 we will experience a die-off equal to, or greater than, that of 1967. It is estimated that work to prevent the alewife from being deposited on the beaches, from fouling the beaches and water intakes, and physically removing the carcasses, once deposited, will cost approximately $1.5 million for 1968.

"The Department of Conservation of

STATEMENT OF FRANK J. KELLEY

Michigan has made detailed studies on cleanup methods and costs, and has a program prepared which has a price tag of over $800,000. The Secretary of Interior has appointed a Task Force to make recommendations to meet the alewife die-off problem. But in the immediate future we face a health and sanitation menace during the summer of 1968, as well as a continued impact on our tourist trade.

"As Chairman of the Michigan Delegation to the Great Lakes Commission, I wish at this time to advise you of that Commission's proposals. The Great Lakes Commission recommends that immediate measures be taken to establish an emergency $3 million Federal-State cooperative alewife cleanup and removal program for Lake Michigan for the years 1968 and 1969. Under this program there would be a minimum 50 percent Federal matching funds which would be funded from funds presently available to the Secretary of the Interior or the Office of Emergency Planning; provisions for reimbursement to States would be provided in the event the Federal share was not forthcoming on a timely basis. Action by the States should include authorization to use general or appropriated funds for the program and appropriation of the necessary amounts.

"We believe action on the proposed program is urgent. Health, sanitation and economic requirements dictate immediate action. We welcome your views and cooperation in this important endeavor.

"Sincerely yours,
"FRANK J. KELLEY
"Attorney General and
"Chairman, Michigan Delegation
"to Great Lakes Commission"

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Whitehall Forum

White Laker

January 4, 1968

"STATE MAPS PLAN TO CLEAN BEACHES IN '68;
$827,000 PROGRAM AIMED AT ALEWIFE DIE-OFF

"Michigan's Department of Conservation has mapped battle plans for combating Lake Michigan's anticipated alewife die-off in 1968 to avoid a repeat of this year's costly and unsightly calamity.

STATEMENT OF FRANK J. KELLEY

"In a report sent to Governor Romney at his request, the Department is proposing an $827,000 cleanup program covering 508 miles of Lake Michigan shoreline and pegged at meeting the alewife problem principally during the peak die-off period from June 15 to mid-August.

"Projected cost of the program is dwarfed by the estimated figure of $55 million in tourist business which was lost on the west side of the State last summer when the stench and sight of hundreds of millions of dead alewives drove vacationers away from the lake's resorts and parks.

"Basically, the Department action-ready plan is a two-pronged attack on the alewife problem.

"First and foremost, it is aimed at removing as many dead fish as possible before they have a chance to reach the lake's beaches. The Department recommends that this be done by paying commercial fishermen some $220,000 to skim dead alewives from the surface of the lake with trawling gear and purse seines.

"The nuisance fish would be hauled

ashore and those suitable for fish meal would be routed to processing plants. The bulk, however, would be buried in specially designated sanitary fills.

"Although it is estimated that commercial fishermen could net about 8,000,000 pounds of alewife for removal, large numbers of the problem fish will still windrow upon beaches where they will have to be picked up, hauled and buried.

"For this second stage of the operation, Department officials hope to field 20 custom-made mechanized beach cleaners which with adequate manpower would cost about $607,000.

"During the past summer, the Department parks division experimented with several types of these machines and results of this field testing give good promise of doing the job. As a bonus, even though the machines would be bought to handle the alewife die-off, they would serve double duty in picking up broken glass, trash, and debris under regular beach-cleaning operations.

"Department officials say it would be

physically impossible for manpower alone to meet the tremendous, far-reaching chore of cleaning up dead alewives along Lake Michigan's shores. Also, this limited approach would cost an estimated $2.5 million in 1968.

"Of immediate concern to the Department is the matter of getting funds to translate its paper plan into an action program. Recognizing that the alewife problem affects Great Lakes States and is considered a regional headache, Department leaders are recommending that the Federal Government appropriate necessary funds to underwrite cleanup and research work.

"The Conservation Department views itself as the mobilizing force in Michigan since it has specialists in the field to work on the alewife problem and can draw readily on resource people to fuse an action group and put its program into operation.

"It is banking heavily on having County highway departments that border Lake Michigan serve as cleanup agencies because they have the 'necessary know-how and organization to put the efforts into effect.' Within towns where intensive beach use takes place, cleanup could be handled by those cities. If Federal monies are made available, they will be parceled out to the cities according to their beach-cleaning responsibilities.

"With time of the essence, the Department is working with the U. S. Bureau of Commercial Fisheries and commercial fishermen on surveys which hopefully will give some fair warning on how large next summer's alewife die-off should be in Lake Michigan.

"Department leaders stress that their present plan is strictly a short-term measure to do the job that needs to be done. Over the long haul, they hope to whip the problem by building up stocks of salmon and trout to restore a favorable balance between predator and prey fish populations in the Great Lakes."

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MR. STEIN: We will take a recess for 10 minutes.

(Recess.)

MR. STEIN: May we reconvene.

Let me make certain procedural points clear again. One, we do not anticipate going much after 5 o'clock. And again, as I pointed out, the stenographer can just take so much of a record, and I think a human being can absorb just so much of this. I say that on the basis of long and sometimes sorry past experience when we have tried to push. We will reconvene at 9:30 in the morning. We will not go much beyond 5 o'clock.

For the rest of the schedule, we will hope to have a better estimate when you people have come up and talked to your State agencies about how long each State presentation will be, with their guests, and try to give you an estimate of when you might appear or be called upon. I suspect that the Federal presentation will take most of tomorrow as well as the rest of today. However, sometime tomorrow morning I would hope to have a further announcement as to when other people might be expected to give their statements.

We will now proceed to the Federal presentation, Mr. Poston.

FEDERAL PRESENTATION

MR. POSTON: We would like to start off our presentations with Federal agencies. The first agency will be represented by Mr. Walter Kiechel, Jr., Assistant Chief of the General Litigation Section in Charge of the Water Resources Unit of the Department of Justice.

Mr. Kiechel is familiar to many of you because of his association with the Great Lakes conversion case for many years.

MR. HOLMER: Mr. Poston, before Mr. Kiechel begins, I would like to ask on behalf of a number of people who have asked me, much as we want to hear Mr. Kiechel, and I know his presentation will be very interesting, but there is some curiosity about the projected sequence for the remainder of this afternoon. Have you reached that decision yet?

MR. POSTON: I had intended to ask secondly Mr. Clevenger, Chairman of the Great Lakes Basin Commission, and thirdly Mr. Stoddard, Regional Coordinator of the Department of the Interior.

MR. HOLMER: Thank you very much.

STATEMENT BY WALTER KIECHEL, JR.
ASST. CHIEF OF THE GENERAL LITIGATION SECTION
IN CHARGE OF THE WATER RESOURCES UNIT
LAND AND NATURAL RESOURCES DIVISION
DEPARTMENT OF JUSTICE

MR. KIECHEL: I assure you, Mr. Holmer, that I will be brief.

Mr. Chairman, distinguished conferees, ladies and gentlemen. I am Walter Kiechel. I am representing Clyde O. Martz, Assistant Attorney General of the Land and Natural Resources Division of the Department of Justice.

The Department of Justice is pleased to accept the invitation of the Chairman to attend and participate in this conference. In addition to the functions of the Attorney General under the Federal Water Pollution Control Act generally, we have a special and continuing concern with respect to the water quality of Lake Michigan.

That concern was demonstrated by the intervention and participation of the United

States in the interstate litigation concluded in June 1967 by decree of the Supreme Court of the United States. I refer to the so-called Lake Diversion litigation, Cases 1, 2, 3 and 11 Original in the Supreme Court in which the States of Wisconsin, Minnesota, Ohio, Pennsylvania, Michigan, New York, and Illinois, as well as the Metropolitan Sanitary District of Greater Chicago, and the United States are parties.

That litigation has a direct bearing on this conference, not only because of the relevance of its many Findings of Fact, confirmed by the Supreme Court, and the scientific evidence supporting such Findings, but because it points the way for our future and I hope our present endeavors.

To pollute Lake Michigan deliberately is, in this enlightened time, unthinkable. But it was not always thus. In fact, less than 10 years ago, the complainant States in that litigation sought and obtained the reopening of the 1930 Supreme Court decree on the representation that the Court should require the return of treated sewage effluent to Lake Michigan.

WALTER KIECHEL, JR.

Prominent in the reasons for intervention by the United States in this reopened litigation was the protection of Lake Michigan and the other Great Lakes as one of the great natural resources of the Nation. By initiating a comprehensive Federal pollution study of the Great Lakes, results from which were introduced into evidence and formed the basis of Findings of Fact, the proposal for discharge into Lake Michigan of sewage effluent was illuminated and rejected.

And so, the direction today is toward keeping pollution out of Lake Michigan, not putting it in. We meet here to pursue the common goal of reducing to the maximum extent possible the introduction of pollutants into Lake Michigan presently taking place. We of the Department of Justice want to assist in that endeavor.

The Federal Water Pollution Control Act provides several tools for water pollution abatement, including the calling of conferences such as this conference that we are having today and the convening of hearings. The Act also provides another tool--litigation. We do not mean to exalt the remedy provided the Secretary, should the other tools be to no avail, of requesting the Attorney General to bring a suit on behalf of the United States to secure abatement of the pollution of Lake Michigan. We hope litigation will not be necessary. But we do mean to make it clear that we will not shirk our responsibilities to wield the tool of enforcement litigation should it be necessary. Clearly, the best solution lies in cooperative and vigorous action under your leadership to develop a voluntary program which will conserve this precious resource.

Thank you.

MR. STEIN: Thank you, Mr. Kiechel.

(Applause.)

MR. STEIN: Walter, as the first Federal participant, you have opened the hunting season. From now on we have a different rule. If there are any comments or questions on the part of the conferees, the rest of the people making statements will be subjected to this nice courtesy we always provide everyone making a statement.

Do you have any?

MR. HOLMER: Yes. When the statement

of Secretary Udall was read, there was reference to the making of recommendations and I am not quite sure whether this is the appropriate time at which to raise this question, and if you prefer that I defer it, that will be fine.

But I would like to ask at this time whether it is within the realm of the conference to make recommendations with respect to the adoption of legislation. I noted that the FWPCA report, which we will be hearing about later, suggested the adoption of a particular piece of legislation governing boat operations. These would not be subject, as I would understand it, to the judicial enforcement proceedings that are provided under the Water Resources Act, the Water Quality Act.

MR. STEIN: I don't know that they are calling for Federal legislation. I am not sure that we have a pattern that is going to satisfy everyone, but here is the situation.

As far as Federal people are concerned, we can make no recommendations as to Federal legislation. That is done by a special process, as many of you who are representatives from the

Federal agencies here know and who are a lot more familiar with the process. Legislation can be proposed in each department by its Secretary. The proposals are then reviewed centrally by the Bureau of the Budget in the Office of the President, at which time we and other departments and agencies are given the opportunity to comment. This is not the appropriate place for us to make comments on Federal legislation.

The other Conferees can make any statement they wish now as far as State legislation is concerned. We have been directed in the Federal Act to recommend and take action toward improved and as far as possible uniform State antipollution control legislation. We have had a considerable amount of activity in this area. As a matter of fact, I think of the laws put out in this field this is probably one of the most successful, it is a best seller anyway, because we have worked with Mr. Poole, Mr. Oeming, Mr. Klassen through the years and others on the committee have developed principals, have suggested legislation and have certain recommendations to make. Within those guidelines we do make recommendations generally to States on legislation and when the State requests it we will specifically comment on a particular bill.

And that is about where we stand on the legislative picture.

MR. HOLMER: Thank you.

MR. STEIN: Thank you.

Any further comment or question?

If not, Mr. Poston.

MR. POSTON: I next call on Mr. Raymond F. Clevenger, Chairman of the Great Lakes Basin Commission. Mr. Clevenger hails from the headquarters in Ann Arbor.

RAYMOND F. CLEVENGER

STATEMENT BY RAYMOND F. CLEVENGER
CHAIRMAN, GREAT LAKES BASIN COMMISSION
ANN ARBOR, MICHIGAN

MR. CLEVENGER: Mr. Chairman and gentlemen. First let me thank you for inviting me here to make a statement. I will try and be brief.

Let me also say that the Great Lakes Basin Commission is not a Federal agency. But we appreciate your hospitality.

While I am Chairman of the Great Lakes Basin Commission, I will not try either to speak for our other Commission members. Each of the States in the entire Great Lakes Basin, as well as every Federal Department having a role in the water and related land resources of the basin, have representatives on the Commission.

Let me speak, though, not only as a concerned public official and citizen, but as one whose family helped settle this basin. One great-grandfather, John Clevenger, was an Indian fighter; another great-granduncle left from here, I find, to serve in the Civil War; and like most of us, another two of my family branches came as later immigrants from Ireland and France.

I was born and raised in Chicago, went to law school in Michigan, and went with my family to make my home in Sault Ste. Marie, in Michigan's Upper Peninsula. Besides being a country lawyer, I've served as the head of a State agency, the Michigan Corporation and Securities Commission, and have had the privilege of representing the northernmost district of Michigan in the 89th Congress.

When President Johnson responded to the request of the eight Great Lakes States Governors and established the Great Lakes Basin Commission last April, he also appointed me its Chairman. Since that time, I've been getting an extensive review of the problems of the Great Lakes, with many of you here as my teachers. So I appear here not as a detached expert, but as one who is going to have to put my money where my mouth is.

We're here in conference because Lake Michigan is really the victim of our success, not our failure. Our population and industrial growth have exploded. Increased leisure time and people intent on using some of their time enjoying the lake have put undreamt recreational demands on Lake Michigan.

Many of you with direct and official concern with water quality conditions have been alert to the problems caused by this success. And because of such concern, our legislatures have worked overtime to change our laws to meet these new conditions and problems. You know that these laws have been required by problems growing each year in geometric proportions. This conference can help us decide how we can best use these laws not only to keep our water problems from getting worse, but to make some headway in solving them.

As I see Lake Michigan, and the entire Great Lakes Basin for that matter, our activities concerning the lake have been fragmented. But this is because the problems and our response to them were fragmented. Lake Michigan and the other lakes were a vast sea. As pockets of population settled along the shores, communities

RAYMOND F. CLEVENGER

could act independently. So long as you could take your drinking water upstream, empty your sewers downstream, have your swimming beaches far enough away from your water intakes, send your fishermen to northern Wisconsin and Michigan, and have your dishes and clothes washed in old-fashioned soap, you had little concern for problems.

The problems generated by the demand for each use of the water, as well as the problems caused by the use itself, could be resolved by setting up a new city department, or creating a new type of municipal corporation, such as a sanitary or water district.

And to make a very long story short, this is what we did. Our problems and agencies didn't begin to run into each other until our population increases and our mobility compressed Chicago and Benton Harbor into an hour's drive instead of a day's excursion. Or, to put it more crudely, our problems weren't great until we found that one city's waste was another city's drinking water. Or again, until we learned that the technological change that helped build the factory to hire you for 40 hours each week also spewed into the lake the beach-closers and fish-killers.

Each part of the lake fought back. As our problems began running into other problems, we created more problem-solvers. In 1966, an Oceanography Committee of the Federal Council for Science and Technology published an informal report on the "Aquatic Sciences in the Great Lakes Area." In summarizing these activities, they found that over 91 State, Federal and international agencies were listed as having some water science activities in the Great Lakes, over 91 of them. And this didn't attempt to list local government activities, much less those of non-governmental entities.

Almost all of these agencies are overworked, understaffed, and just beginning to get public recognition of the losses because of insufficient action, as well as acceptance of the dollar-cost of action. Indeed, as we add staff and increase the number of agencies, we find that with the population growth, we've gotten even further behind. And as the problems become critical in more places and more places spend money, they each find themselves in agonizing competition for money, materials, and men to do the job.

Finally, we're finding, as usual, that some of our solutions become bigger problems than the one resolved. Not only are the solutions in conflict, but the agencies, given problems to solve, find themselves in conflict with other agencies trying to carry out their own problem-solving mission.

Well, one could go on, but you know all of this. Suffice it to say that in a very complex society, we've come to recognize that what happens in Lake Michigan affects what happens in the other Great Lakes; that the solution to one problem has to be related to the solution for other problems; and that what one unit of government does within its claim of sovereign right must be related to what another unit of government does under its claim of right. In other words, we have come to recognize that there must be both coordination of activity and comprehensiveness of activity.

Congress recognized these concepts when it enacted the Federal Water Pollution Control Act under which this conference is being held. But it has gone further and recognized that the coordinated and comprehensive action to solve pollution problems must also be related to coordinated and comprehensive programs in every other aspect of the water resource. And hence the Water Resources Planning Act (Public Law 89-90) passed in 1965.

Under this Act, as you know, Congress authorized the creation of river basin commissions when requested by the States involved and with the concurrence of the Federal Government.

In our case, the Great Lakes Basin Commission covers the entire Great Lakes Basin. The Governors have appointed top-level State executives as their representatives. Federal Departments having a responsibility for any water resource work in the Great Lakes have likewise appointed their top executives as members. Thus each conferee here has also a representative of your State or department on the Commission.

The principal duties of the Great Lakes

Basin Commission are:

1. To engage in such activities and make such studies and investigations as are necessary and desirable to conserve, develop, and utilize the water and related land resources of the Great Lakes on a comprehensive and coordinated basis by the Federal Government, States, localities, and private enterprise with the cooperation of all affected Federal agencies, States, local governments, individuals, corporations, business enterprises, and others concerned; and

2. To engage in such activities and make such studies and investigations as are necessary and desirable to:

    (a) Serve as the principal agency for the coordination of Federal, State, interstate, local and nongovernmental plans for the development of water and related land resources of the Great Lakes;

    (b) Prepare and keep up to date,

to the extent practicable, a comprehensive, coordinated, joint plan for Federal, State, interstate, local and non-governmental development of water and related land resources; provided, that the plan shall include an evaluation of all reasonable alternative means of achieving optimum development of water and related land resources of the Great Lakes Basin, and it may be prepared in stages, including recommendations with respect to individual projects.

(c) Recommend long-range schedules of priorities for the collection and analysis of basic data and for investigation, planning, and construction of projects; and

(d) Foster and undertake such studies of water and related land resources problems of the Great Lakes area as are necessary in the preparation of the plan described in clause (b) above.

There is much more that could be said about our Great Lakes Basin Commission, but suffice it to say that in my opinion this conference may want to take a full and measured look at what might be done by utilizing this legislation in conjunction with your existing State and Federal laws specifically aimed at pollution control.

Someone somewhere pointed out how the Basin Commission could be used. It states well the point that enactment of the Water Quality Act of 1965 marks the important policy shift of the National water pollution control program from an emphasis on the abatement of pollution to the controlled management of future water quality.

Authority and responsibility to manage the quality of the waters of the Lake Michigan

Basin, however, remain widely dispersed among Federal, State and local agencies. Because of this dispersion, an urgent need, along with essential improvements in State and local pollution control programs, is intergovernmental arrangements through which all levels of government will coordinate their separate programs in the basin to achieve the water use and water quality objectives established in the water quality standards program.

The specifics of these arrangements include the following essential functions or features:

1. The arrangements are to provide means for coordinating water quality management programs within the Lake Michigan Basin as a whole, within individual watersheds tributary to the lake, and within major metropolitan areas in the basin.
2. The arrangements are to involve as participants all of the Federal agencies, State and local governments in the basin who manage the quality of

the basin's water resources, and where appropriate, industries and other private activities as well.

3. Initial emphasis is to be given to the development of coordinated programs to implement standards already established in the Lake Michigan Basin and then to serve as the vehicle for joint and continuing development of intergovernmental action programs to improve these standards.

Specific elements to be included in these coordinated implementation programs are, assuming that you and others accept these recommendations:

a. Identification of and agreement on priorities among the various research, technological, financial, or institutional problems and needs in the Lake Michigan Basin.

b. The particular waste treatment or other water-quality management activities which each level of government, or other participating entity, will undertake with respect to the planning of new or improved continuing programs.

c. Methods of funding planned projects and programs in the Lake Michigan Basin, including cost-sharing arrangements where these are necessary for a particular project or activity.

d. Arrangements for the flow and exchange of data which are necessary for a coordinated and basin-wide approach to the water-quality management program in the Lake Michigan Basin.

e. Procedures for initiating or continuing needed studies and planning to develop technological, financial, or institutional solutions to existing impediments to effective basin-wide management of water quality in the Lake Michigan Basin.

f. Arrangements for consultation with civic and other groups interested in the quality of the waters of the Lake Michigan Basin and for the dissemination of information to the citizens of the basin and their elected representatives in order that the latter may understand and properly guide the basin's water-quality management programs.

g. Methods for reviewing progress under a particular action program, and based on such review, the adjustment of the current program or formulation of a new action program.

The vehicle for developing this needed intergovernmental coordination of water-quality management programs throughout the Lake Michigan Basin is the newly established Great Lakes Basin Commission. Including representatives from all States in the basin and from all Federal water resources agencies, this entity is charged by the Water Resources Planning Act of 1965 with serving as the principal agency for the coordination of Federal, State, local and private plans for the development of the water and related land resources of the Great Lakes Basin. As one phase of this role, the Commission also will develop, if needed, more permanent organizational or procedural arrangements for managing the water and related land resources of the Great Lakes Basin.

It is urged, accordingly, that all Federal agencies, the States and local governments in the Lake Michigan Basin, and private interests concerned with water-quality management in the Basin, join in employing the structure and program of the new Commission as the vehicle through which all levels of government in the Basin will coordinate their pollution control programs to achieve the immediate and long-range objectives of an optimum water-quality program.

Gentlemen, what has been said in this is what I believe must be included in your recommendations.

In conclusion, let me add one point that I'm sure we all recognize. What's said above relates primarily to institutional change for better pollution fighting or pollution abatement. But we also must recognize that at some point we have to find ways of making choices between alternative uses of our water resources. One function of the planning effort is to have choices made with knowledge and wisdom, not alone with emotion.

Thank you very much.

(Applause.)

MR. STEIN: Thank you, Mr. Clevenger.

Any comments or questions?

Mr. Poston.

MR. POSTON: I would like to ask Mr. Clevenger about the attitude his Commission might take toward conclusions and recommendations put out by this conference, whether they would be incorporated as part of his plan and what his Commission might do toward assistance in implementing recommendations made by this conference.

I recognize that Mr. Clevenger's organization is relatively new and his staffing is just under way, and our agency as well as other State agencies represented here today have similar working relationships with the Great Lakes Basin Commission, and I wondered whether he would care to comment on just how his agency and this conference might work together.

MR. CLEVENGER: Let me say, Mr. Poston, that first I am sure that our Commission is going to give careful consideration. Along with you on your rostrum I see one member of the Commission, Mr. Mitchell, the alternate member of the Commission, Mr. Oeming, another alternate member from Wisconsin, Mr. Holmer. And with me today I have got a couple of others in case we run into any serious problems.

Let me answer twofold. First of all I am sure the Commission is going to--this is one of the problems on our next agenda for a meeting February 15, which I hope will be just after you conclude these, and if I spend too much time here you won't be able to conclude then, I realize. But let me give you my own views on what I think.

I think we have got too many comprehensive and coordinating agencies doing separate comprehensive and coordinating studies and they never meet together. I think that it would be wrong if we left this conference proceeding, not necessarily these next few days, without seeing if we can't incorporate this entire structure that you create and link it within the Commission.

You see, our Commission is not a separate agency. Our Commission is the State of Michigan and every other State in the basin, it is the Federal agencies that have a water resource responsibility. The whole idea was to pull it together and not add on another level. We have got too many levels, too many people, too many agencies. We have got to try and bring it together.

I don't think we have the personnel and the talent in our society, much less in the Great Lakes Basin or the Lake Michigan Basin, to do this job two, three or four times. We only can do it once. And what you do ought to be what is done by us, because this whole structure--you know, we all operate under the Federal and State laws--this whole structure can be brought together and we ought not duplicate it.

Now, that is my view. And I have a hope that this is going to be the view, as I suggested, of the conferees. It is a question of linking, not a question of duplicating. It is a question of coordinating, not of controlling. It is a way of letting the experts have their expert knowledge apply to where the problem is and not trying to-- You know, we run out of money and we run out of people and every agency is trying to do something that others are trying to do, but each one of the agencies say, "We don't have enough money, we don't have enough people, we don't have that critical mass that is necessary."

Well, for God's sake, let's bring these resources and people and money together and do the job. It only has to be done once. When you clean up the pollution of Lake Michigan in the Illinois and Indiana and Wisconsin and Michigan parts of the lake, there is nothing more to clean up.

Well, you ought to hear me on Sunday morning.

(Laughter and applause.)

You know, if I had known, Murray, that you were going to ask the questions, I would have suggested a few.

(Laughter.)

MR. STEIN: Any further comments or questions?

MR. POSTON: Well, I couldn't agree with Mr. Clevenger more, that we don't need planning, what we need is some action now. And I think that is what we are here at this meeting for, to generate some action. And I hope that that is what comes out of this conference.

MR. CLEVENGER: May I intrude on maybe your dinner hours, and let me suggest what we are doing, what we are trying to do, in the alewife situation.

You know, when I smelled the alewives and when I tried to walk through them, they looked like they were awful pollutants to me. But we are not yet sure whether we are going to describe dead alewives as pollutants.

MR. STEIN: Who isn't sure?

MR. CLEVENGER: Thank you very much.

I agree with you. And now that it has been decided (laughter and applause) let me tell you what I think we ought to do.

You know, when the alewives were about three feet high and the stench had gotten back to Austin Boulevard, one of the Departments, the Department of Interior, set up a task force within itself to examine the alewife problem. Now, all of us would have thought that the alewife problem was the millions of dead ones on the beaches. The task force met and considered that the role of the Federal Government is not necessarily that of a dead fish picker-upper and that really their role was to look at the imbalance, the ecological imbalance in the lake, and the task force turned 180 degrees around and said, "Well, we won't worry, we will do some research on picking up that fish," although I think we could pretty well tell them how to do it,"(laughter) "but we will look at the long-range problems and do a study and give us five million dollars."

The State of Michigan, as Mr. Kelley pointed out, had a smaller task force or group to look at picking up dead alewives and they came back and said, "Give us $875,000 and we can pick it up. We need so many new machines, we need so many new people, we need so many trawlers, and we can do a job." They did not consider what could be done with the machinery, with the men, with the equipment, with the budgets that they had.

Another agency recently came out and said, "What we need is $3,000,000 and it ought to be split between the Federal Government and the State Governments." And they arrived at that $3,000,000 by the technique of saying, "Well, if it costs $875,000 for Michigan, that is about a third of the distance around the lake, it must cost three times that, add a little more in case it gets some Kentucky wind damage and it is $3,000,000." And that was the scientific study.

Our Commission felt that we ought to do this--and we have on our Commission the responsible administrators in the States and the responsible administrators in the Federal agencies.

We said why can't we first take the technical competence that we have and work out a comprehensive answer? Here is the problem, dead fish. Now, what are we going to do with it? Don't worry about State boundary lines or this agency, but what do you do when you have got that many dead fish? When we get that program, then let's call together and involve these in developing them, the State agencies, the Park District of Chicago, the recreational districts of the States, the municipal governments, the health departments, every single governmental agency whether Federal, State, local, and voluntary groups, and the Chamber of Commerce groups over on our side of the lake that represent some of the people that lost $50,000,000, and let's see if we can divide up the work that has to be done and coordinate the work and have each one of them within their existing capabilities do part of the job.

Now, when we are finished we may still need more money and I hope we get it. But if we do ask for it, it is going to be asked for on the basis of knowing that all of the resources we have are committed in a comprehensive and coordinated way and not duplicated and not one at a time. You know, we--well, there is much more that could be said.

But this is how I think and this is what I think coordination and comprehensiveness involve. This is how I think the Federal Government and the State Government and the local governments and the private individuals can work together to solve the very real problems of the lakes and the other resource problems that we have.

MR. STEIN: You know, you just raised the ante. You said 875. I read Nick Olds' statement again and it says 827, and as I read it they want the Government to pay half. Do you go down to their 827 figure?

MR. CLEVENGER: You always want to read, Mr. Stein--well, you are a lawyer--you always want to read a lawyer's figure very carefully.

(Laughter.)

MR. STEIN: That is right.

MR. CLEVENGER: That is the Michigan figure?

MR. STEIN: That is right. But you had 875. I figured that--

MR. CLEVENGER: Oh, are you quibbling about 827 to 875? Well, you know that we plus or minus 100,000.

(Laughter.)

MR. STEIN: That is right. You are a country lawyer, I am a big city lawyer, and that is the way we do business. The difference is $48,000. If I can knock it down half I have just saved a claim or an intended claim against the Federal Government of $24,000. I might have made--

MR. CLEVENGER: We will knock it down. We will knock it down.

MR. STEIN: But I agree this is a point, that we should get together with the alewife problem.

I would like to make one suggestion. There is some confusion on that in the statements that are made. I don't think there has been any linkage, and we are going to get into the alewife problem in more detail a little later. And we were into that in rather complete detail in our lower Lake Michigan conference here a few months ago--at the progress meeting a few months ago.

There is no indication that pollution causes the death of alewives, but I don't think anyone who was around Lake Michigan last summer would contend that after the alewives die they don't create a pollution problem.

MR. CLEVENGER: I agree. Thank you for saying so.

Thank you very much, gentlemen.

MR. STEIN: Thank you.

MR. HOLMER: Mr. Stein.

MR. STEIN: Yes, sir.

(Applause.)

MR. STEIN: Would you wait a moment, Mr. Clevenger?

MR. HOLMER: This new Commission of which Mr. Clevenger is the Chairman is neither a Federal nor a State agency. It is a Federal hyphen State agency, as he indicated when he began. There is a fairly significant difference and it raises a number of questions about the proposed use of the Basin Commission in quite the way that Mr. Clevenger was suggesting.

This is a very useful organization because of its composition. But if, for example, the problems that confront this conference were simply to be referred to the Commission for coordination and for planning, that would leave us in a sad way, would it not?

MR. CLEVENGER: And I hope you didn't understand that I was suggesting that. I am not.

MR. HOLMER: All right.

The chief function of the Commission under the Federal Water Resources Planning Act is the development of a comprehensive water management plan. Is that a succinct statement of the mission?

MR. CLEVENGER: There are two. That is one.

MR. HOLMER: And the other?

MR. CLEVENGER: The other is to engage in such activities and make such studies and investigations as are necessary to carry out the policy of the Act, and the policy of the Act is to conserve, develop and utilize the water and related land resources of the Great Lakes on a comprehensive and coordinated basis by the Federal Government, States, localities and private enterprise with the cooperation of all affected Federal agencies, States, local governments, individuals, corporations, business enterprises, and others concerned. And then it says to engage in such activities and make such studies and investigations as are necessary to carry out the planning.

But there are two duties imposed by Section 204 of the Act. And because this requires that the actions be done by consensus and with the participation of all the governmental units, it is the authority to do it. It doesn't compel you to do it, but it is an authorization to do it. It permits us to have this structure within which all of the agencies can coordinate and work together.

MR. HOLMER: Now, we have a related question. Under the Act under which this conference is being held, the recommendations of the Secretary are made to the water pollution control agencies of the States and to the Federal agencies. Is this not a correct reading of the statute?

MR. STEIN: We make those to the State. Now, we do have a Federal Executive Order. It amounts to the same thing. I just want, because we are talking for the record, to be accurate. We proceed with the Federal agencies under the Federal Executive Order, but when the conferees unanimously have made recommendations and conclusions about Federal agencies and they make them to the Secretary, the Secretary proceeds with the system of getting action under the Federal Executive Order to clean up those Federal agencies. Meanwhile we make recommendations to the State water pollution control agencies to take appropriate action under State and local law to clean up pollution in their jurisdiction.

MR. HOLMER: Recommendations made to the State agencies are, if ignored by the States, enforceable in the courts. Would a recommendation made to the Basin Commission be subject to either the Executive Order or the statute?

MR. STEIN: Our statutory procedure is clear, and we move inexorably either to get the answer telling us we are not going to do it or we are going to follow out the recommendations here and clean up pollution. And I think that has been our record.

I know Mr. Lynch made some reflection in his talk that is what we do, but right now I think we will hear from Mr. Poole and Mr. Klassen.

In Chicago we probably have the biggest industrial waste cleanup construction program in the history of the country going on right under our noses as the result of a Federal-State conference such as this and the oil industry and the steel industry is moving ahead.

New York City is just putting in a $220,000,000 plant going in Manhattan from 138th to 145th Street, one of the largest in the country.

But I think if we ever go and follow

this through, Mr. Holmer is entirely right, we have to follow our statute. First we refer to the State agency. We have in almost all cases had satisfactory results after such referral. As far as I am concerned, the States, particularly the States in this area, have done a magnificent job in cleaning up pollution after the Federal-State conferences and they have cleaned it up under State law, where we have set the schedule and come up with specifics. I am not talking about special programs. But we can go down step by step and these programs that the States have are proceeding. But we have no authority except in our planning authority, to refer it to anyone else under this procedure of the Federal Act and we will follow the Act's procedures specifically.

The Congress, as you know, is very, very specific in the enforcement provisions of the Act. They almost left nothing to chance, very little to discretion at this stage, and we will work with the State agencies as we always have.

Any other questions or comments?

If not, thank you very much, Mr. Clevenger.

MR. MITCHELL: Mr. Chairman.

MR. STEIN: Yes.

MR. MITCHELL: I would like to make a comment.

MR. STEIN: Mr. Mitchell.

MR. MITCHELL: In regard to the Great Lakes Basin Commission, the Act says that nothing is construed in the Act to diminish either Federal or State jurisdiction, and if I interpret Mr. Clevenger's comments he is not saying that we should diminish our own respective jurisdictions. He is saying that as we plan on a long-range basis that we ought to take advantage of this new interstate or intergovernmental agency.

MR. CLEVENGER: What I read about this very two or three pages of recommendations, sometime in private I will tell you where I got those.

But the whole point of this is we ought not to work in isolation. I think we can find a way and I think this is something that is going to happen.

It is relatively easy, I would hope, at this point to recognize the need to stop point by point pollution. What you are recommending is really what people have felt for years and you are marking it and doing that job. But in order to clean up the lake, there is going to have to be some coordinated activity and we ought not to just sort of separate and have separate groups of the same people trying to solve essentially the same problem.

MR. STEIN: I think we all agree with that. And as I read the reports on this, just merely correcting point by point pollution around the fringes of the lake very well may not do the job here. We may have to go quite a bit beyond that. As a matter of fact, our roster of experts tomorrow calls for specialists on eutrophication, currents, phosphate removal, and I think there are very many broad problems that we are going to have to get into that the conferees are going to have to consider.

Are there any comments or questions?

If not, thank you very much.

MR. CLEVENGER: Thank you very much.

MR. STEIN: Well, Mr. Poston, we have run out of lawyers. You can bring on your engineers and scientists.

(Laughter.)

MR. POSTON: Well, I would like to ask Mr. Stoddard, Regional Coordinator for the Western Great Lakes area of the United States Department of the Interior, to come up at this time. I think that there are several other Department of Interior agencies represented and Mr. Stoddard will possibly introduce those.

I wondered, Mr. Stoddard, if we might have some report on the alewife situation?

MR. STEIN: If you would like to gauge yourself, we would like to get out sometime around 5 o'clock and gauge your presentation to that.

MR. STODDARD: I will. We will postpone the alewife discussion until I finish the formal statements here, Mr. Poston.

MR. POSTON: All right.

MR. STODDARD: I have been asked by

the Geological Survey and the Bureau of Mines to present their formal statements. They are unable to be here today. And following these statements the other Bureaus which you referred to will give their statements in person.

STATEMENT OF CHARLES H. STODDARD
REGIONAL COORDINATOR, WESTERN GREAT LAKES AREA
U. S. DEPARTMENT OF THE INTERIOR

MR. STODDARD: My statement is quite brief. It is not intended to duplicate, coordinate nor provide any advance disclosure of the complete and carefully drawn statements to be made by the several Interior bureau regional offices, but rather to make some suggestions for your longer term consideration, particularly in the research field, by the universities, by the Federal bureaus, by the State agencies, and so forth.

During the past year I have had an opportunity, a rather unique opportunity, to spend some time going into the whole question of the technology and the economics of the various aspects of the quality of the environment and the deterioration that has taken place. And out of these studies I would like to identify for your consideration a few of what seem to me highly significant points relative to controlling Lake Michigan pollution, particularly in the face of our expanding population and economic growth in the Basin.

I think from our earlier discussions it is quite clear that unless present waste disposal is curtailed the lake is headed for fairly rapid deterioration. It is equally clear that we must deal immediately with the backlog of needed treatment facilities, both industrial and municipal, which must be installed to arrest this deterioration and which can no longer be postponed. Nationwide the backlog of investment has increased from six billion dollars in about 1958 to a figure just released in the last several days from the Federal Water Pollution Control Administration of twenty-six billion dollars. This is 10 years of growth of backlog despite the really major efforts that we have been making during the 1960's.

It is probably less clear that even if we deal with this backlog the real threat in the foreseeable future is the accelerating rate of our economic and population expansion--the effluent of which could bring on final disaster. It is estimated that in 50 years water use in the Great Lakes, Lake Michigan, will be 3 times the present use; that our economic activity could be 6 times the present rate of activity. I think this perhaps takes exception with Chairman Clevenger's point that once we clean up the lake it is done for, we don't have to worry anymore. I think our real worries are ahead of us.

It is even less clear that we must think about and plan for built-in prevention as well as correction of present pollution sources if the present eutrophication trends are not only to be stopped but reversed. This means acceleration of the technology of waste utilization, not simply treatment.

We are hardly even now discussing the question of whether prevention can and should consist of recycling presently wasted materials by considering them a valuable natural resource to be utilized and no longer wasted. Fertilizers, minerals, useful chemicals and other byproducts needed by our expanding economy can be derived from currently wasted resources.

The Milwaukee Sanitary Commission years ago pioneered in the production of Milorganite--I think most lawn keepers are familiar with Milorganite--and they sold this at a loss, but they turned loose fewer solids into Lake Michigan and produced some revenue from this process. We have hardly mentioned the possibility of subsidizing the cost of utilization of these waste materials (if they do not break even in processing) as an alternative to spending large sums to partially treat them and then dispose of the residual effluents anyway.

It has been mentioned that we do have to give special attention to controls over the two new types of pollution which are hitting us quite recently, and we can foresee much more concern in the future over them. Thermal pollution and agricultural pesticides, if left unattended, could undo all of our present efforts to control other sources.

Athelstan Spilhaus, the geophysicist, made a rather interesting statement at the American Association of Advancement of Science on the whole question of the total extinction of junk and waste by carefully-designed processing and recycling of all waste products. "Junk," he said, "is a word that epitomizes the immorality and ignorance of not recycling. What we need is the jump toward total recycling, control at the source, symbiosis of industry and massive experiments with entirely new technologies toward this end."

On all of these aspects of the problem, the Interior team of bureaus has accumulated much information and is ready to go into research to find answers to technical and economic impediments still blocking effective recycling of wasted materials.

Now, I have the statements here of the Bureau of Mines and the Geological Survey.

Area Director Bishop of the Bureau of Mines had a very sore throat and was hoarse, so that he wasn't able to give it.

STATEMENT OF THE U. S. BUREAU OF MINES
O. M. BISHOP, AREA DIRECTOR, AREA III

The Department of the Interior has recently issued Conservation Yearbook No. 4, titled "Man--An Endangered Species?" It states, "Man stands at a fork in his environmental road to the future." Will he succumb to overpopulation and technology that too often fails to consider the environment and the necessities of ecological systems other than that which he thinks to be his own?

Modern man's use of minerals illustrates both his genius and his failure in this respect. In the Chicago Harbor area the steel industry produces tens of millions of tons of steel and iron products annually, and each year also produces several hundred thousand tons of flue dusts which are recovered from the open hearth, basic-oxygen, and electric furnace off-gases, but are largely not reprocessed for their 60 percent iron content because the physical structure, zinc content, or some other factor makes it more economic to ship in new iron ore rather than utilize the flue dust.

Such flue dusts formed a very considerable part of the 7.4 million cubic yards of material dredged from the Indiana and Calumet Harbor areas from May 1949 through July 1967.

These 7.4 million cubic yards of dredging contained iron oxides, zinc, cadmium, and petroleum sludges that are not only pollutants, but also are mineral resources in our hands if we follow the conservation ethic.

We cannot afford to treat these materials solely as pollutants or garbage. They must also be looked upon as the raw material for research, jobs, and manufactures. Just as the astronaut must learn to meet long-term water, food, and material supply by recycling his wastes, so must man on his space vehicle, Earth, recycle his wastes.

I do not believe old automobile hulks

or garbage should be buried at sea nor do I believe Lake Michigan the proper burial ground for the flue dusts dredged from the Chicago Harbor by the Corps. Such waste products must be recycled to use, and if our technology is now short, then by some combination of incentives it must be caused to grow until it is adequate to the purpose.

Incidentally, output of flue dusts is increasing. This is because the lower cost more productive basic-oxygen steel process to which industry is converting produces roughly three times as much flue dust per ton of ingot steel as did the old open hearth furnace.

In closing, I would like to point out that technology can be developed to conserve this resource, but that research in both industry and government laboratories must be stimulated to the task. The research facilities of the Bureau of Mines, which are intensively geared to primary mineral raw material studies and analysis, stand ready for an expanded role in finding economic means for utilizing and recycling. These valuable resources are now being wasted and, in fact, damaging man's environment.

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MR. STODDARD: I have the Geological Survey statement also here.

STATEMENT OF THE U. S. GEOLOGICAL SURVEY PROGRAM IN THE LAKE MICHIGAN BASIN, 1968

Facts on the water resources and the changing water situations throughout Lake Michigan Basin are a foundation for the planning of water use and development and for the solution of water pollution problems. Information on the occurrence, quantity, and quality of water in streams and in underground reservoirs has been collected, analyzed, and published for many years by the U. S. Geological Survey in close cooperation with State agencies.

The collection of water resources data in the Lake Michigan Basin has been in progress for well over 50 years. Thus, the Department of the Interior, through the Geological Survey, has had a long history of close cooperation with State agencies in appraising the water resources of the States bounding Lake Michigan. The State agencies and the USGS work in very close cooperation in order that the work of one may supplement that of the other without conflict and duplication. Close cooperation is also maintained with other Federal agencies, such as the Corps of Engineers, the Soil Conservation Service, and the Bureau of Sport Fisheries and Wildlife.

The U.S. Geological Survey cooperative water program is unique among water agencies. It does not regulate water; nor does it market or produce hydroelectric power. It has no water development projects to promote, no dams to build, no irrigation projects to operate. Its purpose, rather, is to evaluate the quantity, quality and distribution of water resources and to make such information available to the public and to agencies with the above functions. It is unique also in the extent to which it shares with State and local water agencies the responsibility for planning and financing investigational programs directed toward acquiring knowledge about water.

Investigations now in progress in States lying within the Lake Michigan Basin include the systematic observation and measurement of the changing water situations in the streams and ground-water reservoirs. Streamflow, sediment, and quality data are collected for major and many minor tributaries, and ground-water levels and water quality data are collected for underground reservoirs. Studies are also underway to determine the availability, quantity, use, and quality of surface and ground water in river basins, counties, and problem areas. One purpose of these investigations is to provide an understanding of the water situation as related to specific problems. Also, information on the effects of land and water use on the hydrologic environment may be used by water managers to assist in solving current and future water pollution problems.

Cooperative studies of the water resources in the Lake Michigan Basin have resulted in numerous published reports describing the water situation in many areas of present and potential water development. Information on the results of these reports and on specific basic data may be obtained through the contacts listed on the attached page. Additional detailed information, such as mineral resources and topography, may be obtained from other divisions of the USGS.

The U.S. Geological Survey and cooperating agencies have an interest in furnishing accurate hydrologic data to water management agencies responsible for the definition and abatement of pollution.

January 19, 1968

Sources of Information on the
Geological Survey Program in
the Lake Michigan Basin, 1968

Information on publications and basic data on water within tributary basins, including ground water, surface water, and chemical quality of water, may be obtained through the following contacts:

Michigan - Arlington D. Ash, District Chief
Water Resources Division, USGS
Room 700, Capitol Savings and
Loan Building, Lansing, Michigan
48933

Wisconsin - C.L.R. Holt, Jr., District Chief
Water Resources Division, USGS
1815 University Avenue
Madison, Wisconsin 53706

Illinois - William D. Mitchell, District Chief
Water Resources Division, USGS
605 South Neil Street
Champaign, Illinois 61820

Indiana - Malcolm D. Hale, District Chief
Water Resources Division, USGS
Room 516, 611 North Park Avenue
Indianapolis, Indiana 46204

GEOLOGICAL SURVEY

Information on mineral resources and topographic mapping may be obtained through the following contacts:

Carl E. Dutton, Research Geologist
Geologic Division
U. S. Geological Survey
222 Science Hall
Madison, Wisconsin 53706

Daniel Kennedy, Central Region Engineer
Topographic Division
U. S. Geological Survey
Box 133
Rolla, Missouri 65401

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That is the conclusion of the formal statement.

Now, Mr. Poston asked about alewives. John Mitchell is my co-task force chairman--is that the title that we have, Mr. Clevenger -- on the Great Lakes Basin Commission? The work that is now underway by a joint group of Federal and State agency people, we haven't received any draft report of suggestions of how to deal with this. The proposal is that at the February 15 meeting of the Great Lakes Basin Commission there will be a report by the alewife working planning task force for consideration by the Commission. And the Commission then will act upon the recommendations of this working task force, presumably to call a conference sometime shortly thereafter, for the purpose of pulling together the various State and Federal and local agencies and private groups into a coordinated team for handling what probably will be a crash program if we have a die-off this summer similar to last summer. This is essentially a fire department type of activity getting ready for the event of an emergency. All of us hope we don't have it, but if it happens again we will be more prepared than we were last summer.

I think that is about all I can tell you about it right now, Mr. Poston.

MR. STEIN: Are there any comments or questions?

MR. HOLMER: I have first a procedural question. Will the Federal witnesses be presented throughout the conference so that we might pose our questions perhaps in a more orderly way? My question has to do with taconite, for example, at this point. I don't want to miss the chance while we have the Bureau of Mines statement before us.

MR. STEIN: The point is, some of the people we have here are very busy. I don't know what their schedule is. They certainly haven't been committed to stay here a long time. However, we will have the experts here who will be able to answer the questions. This is a question of procedure.

If you have something on taconite, you might ask that as early as possible, because I am not sure we have the Bureau of Mines person here, but we can get them here before this conference is over or get you the answer.

MR. HOLMER: The question, Mr. Stoddard, has to do not so much with the pollution of the water as alternatives in a prevention way to deal with this problem that is concerning us, particularly on Lake Superior at the moment.

MR. STODDARD: Let's take the Lake Superior one and then the larger issue of handling the waste.

MR. HOLMER: Would you describe it for the audience?

MR. STODDARD: The taconite industry is a relatively new one in northern Minnesota. A low grade iron ore, including 30 percent iron, is ground very finely and by a magnetic process the iron is retrieved out of this powder and formed into pellets, which are then shipped out in other carriers the same way that natural ore is shipped. The waste product is 70 percent silica and other finely ground material, almost like a talcum powder, and in practically all of the taconite developments that have taken place in Minnesota they have recycled the water.

They have taken an old swamp or a lake and used the water constantly in washing off, washing out, this waste material.

However, one plant, located at Silver Bay, is turning loose the waste directly into Lake Superior, about 60,000 tons a day. There have been various claims over the years concerned about the fishing falling off there in the area, about possibly some toxic materials being turned loose,about the deposition of sediment. If you look at the topographic chart in reverse of the Great Lakes there in the hall, you will notice there is a big trough in the middle of Lake Superior. The theory is that this taconite waste is all going down into this trough, which is infertile and does not provide any habitat for fishlife. However, as I say, there have been charges that a good deal of this material does stay in suspension and is carried by the current in a northeast-southwest direction around the lake back around on the Wisconsin side.

Until the data are obtained and really careful water quality studies are made, both in terms of whatever toxicity may develop from materials that are turned loose that may go into solution--previously it was thought that these materials were insoluble and therefore caused no trouble. However, there is some evidence that they may be going into solution. Studies of whether the silt that does not go down in the trough does cover up spawning beds of fish and many other related questions are involved in this study to find out just exactly what is happening. And this study will probably be carried on by at least four Interior bureaus plus the State of Minnesota Conservation Department.

Now--

MR. HOLMER: What about prevention?

MR. STODDARD: Prevention?

MR. HOLMER: Yes.

MR. STODDARD: Well, prevention is really the location of these plants away from the Great Lakes in such a way that it is possible to use a swamp or a large basin which would provide a source of water and also a place to dispose of the tailings so that you don't have to turn this water loose which presumably would contain any toxicant materials that would go in solution, if this is the case, into the streams of the area, into the ground water or into the subsoil. Now, some of it may get in the subsoil just through infiltration, but I think there is not much problem developed in northern Minnesota away from the lake with respect to the recycling of water and disposal of the waste. I haven't heard of any.

MR. HOLMER: Thank you.

MR. STEIN: Thank you.

Thank you very much, Mr. Stoddard.

I think we have come pretty close to 5 o'clock. Now, I would say the people who are going to participate and the attendees can help us with the conference if they would do two things. One, it would be very helpful if you had copies of your statement to distribute to the conferees. The staff in the back will help you get these duplicated if you don't have enough.

Secondly, when you leave the room, remember when you get through those flimsy doors in the back we can still hear you. Just keep your conversation down if you could until you go outside the anteroom, and that will help facilitate the orderly conduct of the conference and we won't be interfering with the others who are in here.

With that, we will stand recessed until 9:30 tomorrow morning.

(Whereupon, at 5:00 p.m., an adjournment was taken.)

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